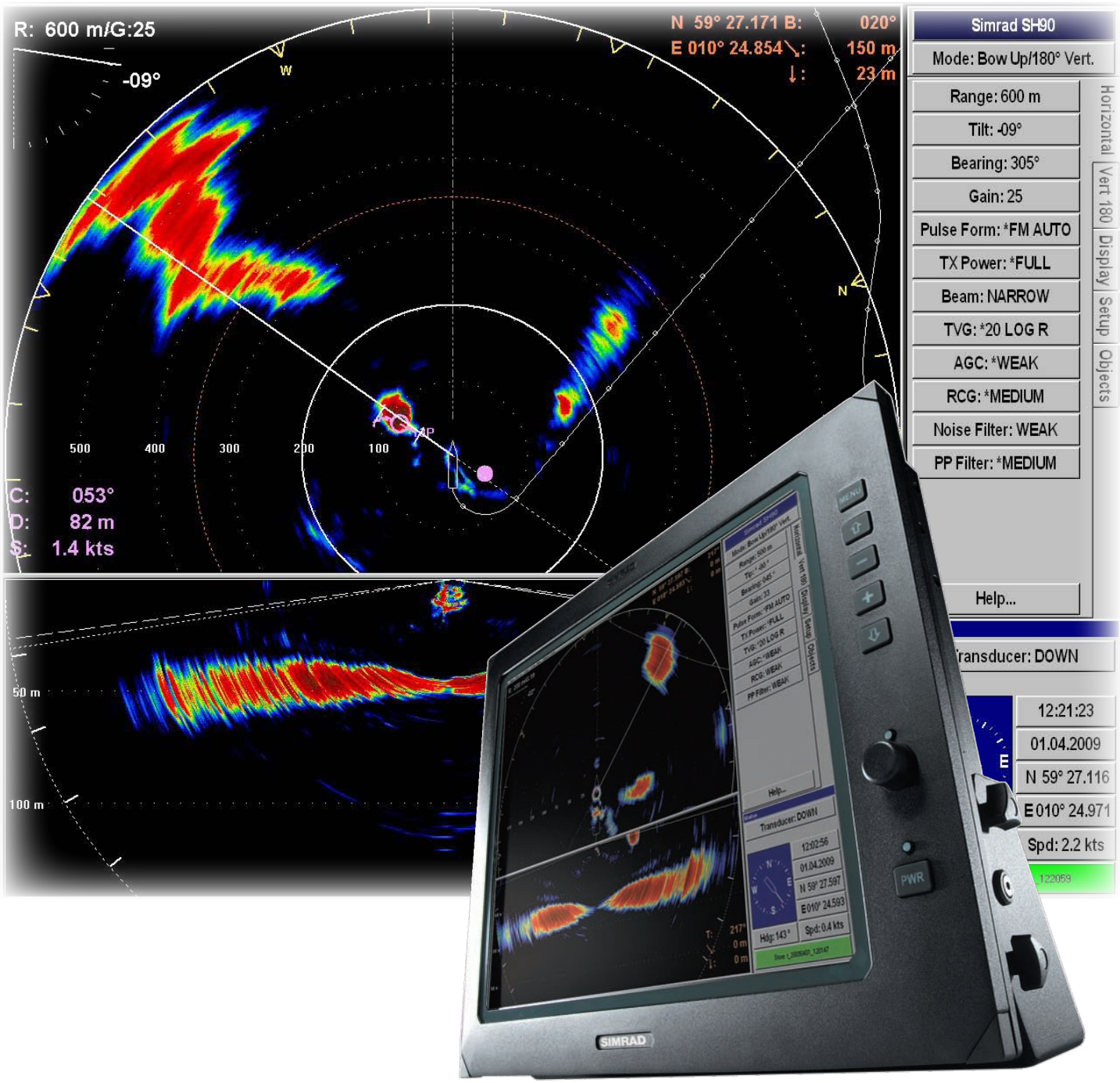
Reference manual

Simrad SH90
Fish finding sonar



Simrad SH90

Reference manual

This manual provides you with reference information required to operate and fully understand the commands, menus, operational modes and options provided by the Simrad SH90. For user information in brief, refer to the *Simrad SH90 Operator manual*.

WARNING: The Simrad SH90 sonar must never be powered up when the ship is in dry dock. The transducer will be damaged if it transmits in open air. To prevent inadvertent use of the sonar, pull out the mains plug on the Processor Unit whenever the vessel is in dry dock.

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Rev.A	10.05.2010	First release. Released for SW 2.1.X.
Rev.B	20.08.2010	New procedures for software backup and restore. See *Software procedures* on page 60.

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. The user must be familiar with the contents of the appropriate manuals before attempting to install, operate or work on the equipment.
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Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: contact@simrad.com. If you need information about our other products, visit our web site. On the web site you will also find a list of our dealers and distributors.

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ABOUT THIS MANUAL

Purpose

The purpose of this reference manual is to provide the descriptions, procedures and detailed parameter explanations required to allow for safe and efficient use of the Simrad SH90, as well as a thorough understanding of the system parameters and adjustments.

A good understanding of system functions and controls is essential to fully take advantage of the functionality provided. Sea conditions vary, sometimes drastically, and it is not possible to identify settings that will provide the best data at all times. Careful study of the information in this manual is highly recommended, preferably while exploring the system's functionality.

System operation is a dynamic activity requiring regular adjustments and fine tuning to achieve the best possible results under varying environmental conditions.

Software version

This manual complies to software version 2.1.X.

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References

The following user manuals have been provided for the Simrad SH90. English manuals are provided with the SH90 when it is shipped. When available, manuals in other languages may be downloaded from http://www.simrad.com.

- Simrad SH90 Installation Manual, English **[323776]**
- Simrad SH90 Operator Manual, English **[323773]**
- Simrad SH90 Reference Manual, English **[323775]**

SIMRAD SH90

Study this chapter to familiarize yourself with the Simrad SH90.

Topics

- *Important matters* on page 12
- *Basic information* on page 13
- *Main units* on page 14
- *System diagram* on page 17
- *Basic functionality* on page 17
- *Optional functionality* on page 21
- *Peripheral equipment* on page 22
- *Support information* on page 23

Important matters

As with all advanced instruments, there are a few important matters about the SH90 that you must remember.

Before you switch on the sonar

Before you power up the sonar, make sure that you have sufficient water depth to lower the transducer!

When the sonar is not in use

To protect the sonar when it is not in use, we strongly advice you to hoist the transducer, even though you may not switch off the power. In narrow or shallow waters this is very important, since you may - in worst case - run the transducer into the bottom. This will damage the transducer and the transducer shaft, and extensive repair is required.

When you dock the vessel

It is very important that the sonar system remains switched off when the vessel is in dry dock. If the transducer is subjected to transmit power when it is in open air, it will be damaged. As a safeguarding measure, you can remove the power fuses on the sonar system before the vessel is docked. As an extra safeguarding measure, the sonar is by default powered up with the transmit power switched off.

Manual operation of the hull unit

In the event of improper operation, the powerful 3 kW electric motor may cause serious damage to the equipment and/or injury to personnel.

Therefore, before you start the operation, read carefully through the relevant procedure(s). You will then familiarize yourself with the method .

If something breaks down

If you think that something has been damaged on the sonar, contact your local dealer for advice.

Basic information

The Simrad SH90 is an omnidirectional high frequency sonar.

It is designed for all sized fishing vessels, both purse seiners and trawlers.

The operational frequency is 114 kHz. The cylindrical multi-element transducer allows the omnidirectional sonar beam to be tilted electronically from +10 to –60 degrees. This allows you to automatically track schools of fish, and to observe the whole water volume around the vessel. A stabilising system is included for electronic pitch and roll compensation.

Great emphasis has been placed on giving the best possible presentations on a high resolution colour display.

The SH90 Processor Unit is controlled by Microsoft's Windows XP® operating system, which result in a flexible choice of display modes for a large range of user applications.

The signal processing and beamforming is performed in a fast digital signal processing system using the full dynamic range of the signals.

In addition to the traditional single frequency transceiver system, the Simrad SH90 contains an advanced frequency modulated filter system (FM).

Main units

The Simrad SH90 comprises the following units:

Normally installed in the wheelhouse:

- *Display Unit*
- *Operating Panel*
- *Processor Unit*
- *Operating Panel power supply*

Normally installed in the sonar room:

- *Transceiver Unit*
- *Power Supply Unit*
- *Hull Unit*

Wheelhouse units

Display Unit

The colour display is a high-resolution monitor. In addition to the sonar picture, the monitor will also display the menu system for the interactive operation. In order to ease the situation comprehension, certain colours have been chosen to better the distinction between the various elements in the presentation.

The colour display is not a part of the sonar delivery, and it must be purchased locally.

Operating Panel

Figure 1 Operating Panel

The Operating Panel contains all necessary control functions for normal operation of the sonar.

The controls are arranged in logical function groups, this gives a clear and easy operation.

Note that all sonar operation can also be made using the trackball on the Operating Panel and the menu system. You can also use a standard computer mouse.

Processor Unit

The **Processor Unit** is a marine computer based on the Microsoft Windows XP® operating system. It is designed for rugged use.

The computer is based on a commercial design, but the software and hardware has been specified and assembled by Simrad to suit the SH90 requirements.

The computer holds a DVD player for use with future software upgrades.

Figure 2 Processor Unit

The purpose of this computer is to allow you to control the sonar. The computer serves several functions.

- It controls the overall operation of the sonar functions.
- It provides the graphic presentation of the sonar modes and echoes.
- It holds the menu system.
- It communicates with the Operating Panel to read the buttons and trackball movements.
- It performs the advanced signal processing and beamforming required to present the information on the display.
- It communicates with peripheral devices and sensors using serial lines.
- It communicates with the Transceiver Unit.

Operating Panel power supply

A small power supply is implemented to provide stand-by power to the Operating Panel. The power supply is connected to the Processor Unit.

Sonar room units

Transceiver Unit

The SH90 Transceiver Unit is located in the sonar room, close to the Hull Unit.

The transceiver performs the transmission and reception control of the 480 transmitters and 480 receiver channels. 16 identical transceiver boards are used. A dedicated power supply is provided to supply the required DC voltages to the transceiver. One Ethernet cable is used for communication with the Processor

Unit in the wheelhouse, and a second Ethernet cable is used to control the hull unit. The third Ethernet cable connects to the Power Supply Unit.

The transducer cables from the hull unit are plugged into the side wall of the Transceiver Unit cabinet using a special plug.

The Transceiver Unit is mounted on the bulkhead using powerful shock absorbers. The connectors for power and interface are located at the bottom of the cabinet.

Power Supply Unit

A dedicated power supply cabinet is used to provide the Transceiver Unit with operational power.

WARNING

The power supply cabinet contains high voltages. Do not open the cabinet door while the SH90 is switched on.

Hull Unit

The **Hull Unit** is designed to lower the transducer 1.0 meters below the ship's hull.

The transducer can also be lowered to any selected middle position. In case of voltage failure, the transducer can be raised or lowered manually by means of a hand crank.

The sensor for the electronic stabilisation of the sonar beams is housed in the Motor Control Unit, which is mounted on the Hull Unit.

WARNING

If the transducer hits larger objects or bottom, the transducer shaft may be bent, or - in worst case - it can be broken off. A broken transducer shaft will cause water leakage through the top of the shaft.

In such cases, do not raise the transducer shaft to its upper position.

To prevent serious damage, you must have a water pump and a warning system in the sonar room.

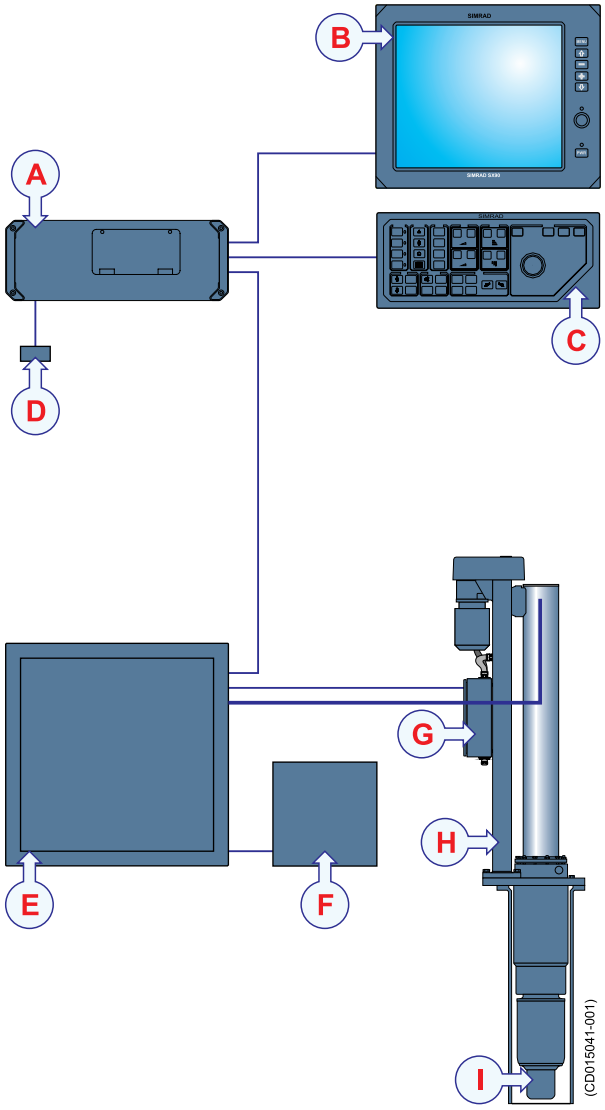
Transducer

The cylindrical **Transducer** allows the sonar beam to give full 360 degrees coverage of the water volume from +10 and down to -60 degrees.

System diagram

Figure 3 SH90 Simplified system diagram

A *Processor Unit*
B *Display Unit*
C *Operating Panel*
D *Operating Panel power supply*
E *Transceiver Unit*
F *Power Supply Unit*
G *Motor Control Unit*
H *Hull Unit*
I *Transducer*



Basic functionality

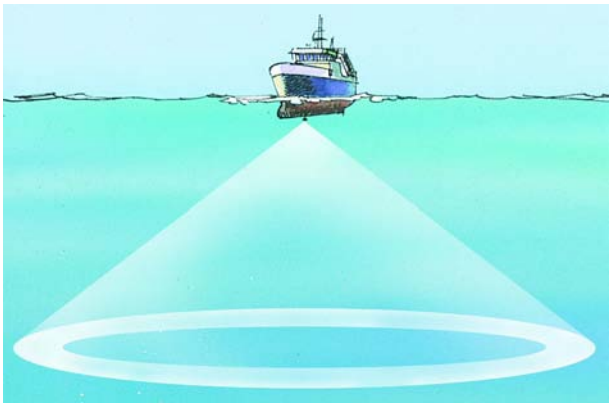
The basic principles of the Simrad SH90 are unique because of the 480 transmitter and 480 receiver channels with their transducer elements spread around on the cylindrical transducer.

The transmission, reception and data processing are under computer control, and the powerful capabilities of the sonar are the results of sophisticated digital signal processing software and state of the art hardware.

Omni beam

When the *Omni* beam is tilted, the total beam picture can be compared with folding an umbrella, which means that all beams in 360 degrees around the vessel have the same tilt angle.

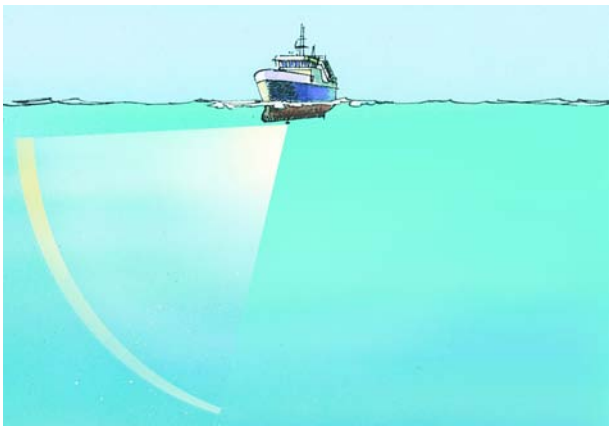
Figure 4 Omni beam principle



The beam can be tilted from +10 up to -60 degrees down.

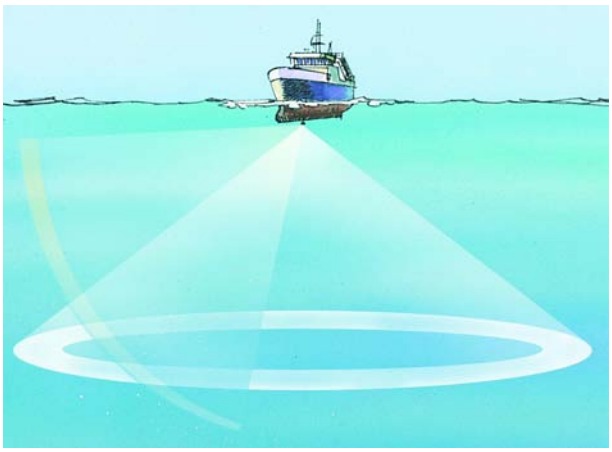
In addition to seeing the target from above, it is also possible to see the target from the side, by using the vertical slice presentation. In this case the beam covers a continuous vertical beam from 0 to -60 degrees in one transmission.

Figure 5 60 degrees vertical slice



This vertical slice, which is presented by the white audio line in the horizontal picture, can be selected to any bearing by the manual training control. The combination of the Omni mode and the vertical slice will give an optimal visualization of the catch situation.

Figure 6 Omni/vertical combination



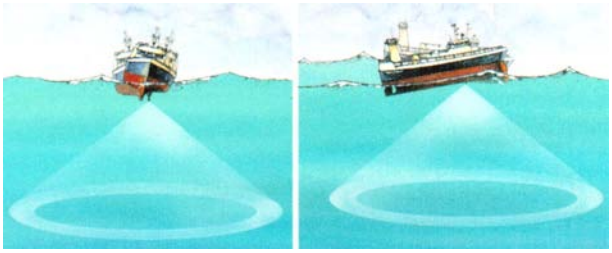
In addition to the *Omni* picture, the vertical slice is especially useful for visualizing the vertical distribution of a school of fish. In that way, it is not necessary to go over the target to see the distribution on the echo sounder, which often results in a spreading of the school.

Stabilisation system

The Simrad SH90 is provided with a stabilisation system.

When the beam stabilizer is activated, both horizontal and vertical beams will be stabilized electronically for roll and pitch movements up to ±20 degrees. The beam direction will then change continuously according to the vessel's movements, and secure an optimal contact with the targets even in rough seas.

Figure 7 Stabilisation system



Reception

A great effort has been made to reduce unwanted noise to get a clean and stable echo presentation. To achieve this goal the sonar receiver has the following filtering possibilities:

- FM Correlation filter
- AGC (Automatic Gain Control)
- RCG (Reverberation Controlled Gain)
- Ping-to-ping filter
- TVG (Time Variable Gain)
- Noise filter

FM Correlation filter

The FM (frequency modulation) is a sweep in frequencies. The receiver filters out those signals that are the same as the transmitted. This provides a filtering effect, which efficiently reduces interference, noise and reverberation. In addition to giving a clean and stable echo presentation, this will normally also increase the sonar's detection range. The advantage of the FM correlation filter is that it retains the high resolution in range with long pulse lengths and high energy, and that it is not sensitive to moving targets.

AGC (Automatic Gain Control)

The AGC (Automatic Gain Control) senses the echo level in several directions, and use this as a basis for adjusting all the receiver beams. The AGC will thus provide automatic scaling of the data in order to maintain proper dynamic range based on all echo values

The strength of the filter can be selected in the menu.

RCG (Reverberation Controlled Gain)

The RCG function adjust the picture to minimize influence from bottom and surface reverberation.

The strength of the filter can be selected in the menu. With maximum strength is selected, the RCG will effectively reduce the bottom in shallow water, while variations on the bottom will be displayed. Note that scattered fish can be perceived as reverberation. The RCG filter must therefore be used with care if scattered schools are to be detected.

Ping-to-ping filter

Thee Simrad SH90 is equipped with a ping-to-ping filter (PP Filter) to provide a clean and steady presentation by reducing the interference and noise. This filter compares the echoes from a

selected amount of transmissions (pings), and an echo has to be present in the selected amount of pings in order to be presented on the display.

Note that in rough seas, when the beam easily can miss the target in several pings, the PP Filter must be used with care.

TVG (Time Variable Gain)

The Time Variable Gain (TVG) function controls the gain of the receiver so that a school with a given size and density is presented with approximately the same strength on the display, inside the regulated TVG range. This can also be seen as a filter, because it reduces the noise close to the vessel. The regulated strength of the TVG can be selected in the menu.

Noise filter

The noise filter is designed to remove unwanted acoustic noise from the sonar picture. It will reduce the interference from other acoustic systems (sonars and echo sounders) on your own vessel and from other vessels in the vicinity. It will also suppress the noise from your own propellers and from other similar noise sources.

Transmission

The transmission is controlled from the Processor Unit. The parameters you have chosen are transferred to the Transceiver Unit by means of the Ethernet cable.

The Transceiver Unit contains 480 transmitter channels which are distributed on 16 identical transceiver circuit boards. Each transmitter channel is individually loaded with the parameters for the relevant transducer element position. The parameters include power output and time delay to form a beam with the selected beam angle.

When the stabilising system is active, the tilt angle for each beam will automatically be corrected relative to the vessel's pitch and roll movements.

Optional functionality

The Simrad SH90 is a single 114 kHz sonar with beam stabilisation.

The options described below are preprogrammed into the standard software version, and a code word is required to make the actual option available.

- Scientific output

Scientific output

The Scientific Output is designed for research purposes. When activated, the following data are available on an Ethernet (LAN) output:

- Beam data
- Target data
- Own ship data
- Gear data

The scientific output option may also include software for a Scientific Data Logger.

Peripheral equipment

The Simrad SH90 requires connection to a speed log and a course gyro. An inaccurate log or gyro input will cause inaccurate indication of the vessel and target movements.

In addition to log and gyro, the following peripheral equipment can be connected to the sonar:

- A (D)GPS may be connected to the sonar to establish the vessels position and provide cursor and marker latitude and longitude.
- A Simrad catch monitoring system will provide the net depth in digits and bars on the catch data presentation.
- Simrad trawl instrumentation:
  - Simrad FS70, FS900 and FS3300: The trawl will be displayed in correct depth.
  - Simrad ITI: The trawl will be displayed in correct size, depth, distance and bearing.
- A current meter system will indicate the current speed and direction for up to three different depths in the sonar picture.
- A radio buoy system (GPS type) will provide the geographical position of the buoy(s) in the sonar picture.

For connection of any of this peripheral equipment, contact your local dealer.

Support information

If you need additional technical support for your Simrad SH90 you must contact your local dealer, or one of our support departments.

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- **Website**: http://www.simrad.com

GETTING STARTED

Please find the basic information required to get you started up with the Simrad SH90.

Topics

- *Operating Panel* on page 24
- *Power on/off procedures* on page 25
- *How to perform basic operations* on page 27
- *Visual aids* on page 32
- *Cosmetics* on page 33
- *On-line help* on page 36

Operating Panel

The most frequently used functions are directly accessible by the designated control buttons on the Operating Panel, and may enter operational commands directly.

The buttons are grouped in fields according to their purpose. Most sonar functions are also accessible and activated using the menu system on the display and the trackball and **Select** button on the Operating Panel.

Figure 8 Operating Panel

A **Main switch**: Power the sonar on (and off), lower and hoist the transducer

B **Symbol**: Control the target markers providing exact latitude and longitude positioning.

C **Mode**: Select your favourite display mode or user setting with the push on a button.

D **Gain**: Separate gain control for horizontal and vertical sonar presentation.

E **Range**: Separate range control for horizontal and vertical sonar presentation.

F **Cursor**: Menu and cursor control.

G **Tilt**: Easy control of the sonar's tilt angle, or start automatic search program.

H **Various**: Store interesting screen captures, and zoom in on details.

I **Train**: Manual control of beam training, start automatic search and tracking programs.

Power on/off procedures

These procedures explain how to switch the sonar system on and off. The operation is made using the buttons on the operating panel.

Figure 9 Operating Panel

How to switch on the sonar

This procedure explains how to power up the Simrad SH90.

1 Press the **Power** button on the colour display monitor.

2 Press the **Power** button on the Operating Panel, and keep it depressed for approximately two seconds.

- The green lamp on the right side of the button will flash to indicated that the power has been switched on, and that the computer is starting up.
- After a short period you will see the sonar picture on the display.
- If the sonar system has been disconnected from AC power, the Processor Unit must be started manually. Use the on/off switch behind the lid on the front panel.

3 Check that the water depth beneath the keel is sufficient to lower the transducer.

4 Press the **Down** button on the control panel to lower the transducer.

- The green lamp next to the button will flash, and an audible signal indicates that the transducer is lowered.
- When the lower position has been reached, the lamp will be lit continuously, the audible signal stops, and the top button in the **Status** parameter dialog shows **Transducer:Down**.
- By default the transmit power is disabled when the sonar is powered up. This is for safety reasons. On the **Horizontal** menu, you will see that the **TX power** button flashes to remind you of this.

5 Click the **TX power** to select **Full**.

How to switch off the sonar

This procedure explains how to power off the Simrad SH90.

1 Press the **Up** button on the Operating Panel.

- The green lamp next to the button will flash, and an audible signal indicates that the transducer is hoisted.
- When the upper position has been reached, the lamp will illuminate continuously, the audible signal stops, and the upper button in the **Status** menu shows **Transducer: UP**.

2 Press the **Power** button on the Operating Panel, and keep it depressed for approximately two seconds.

3 Switch off the display monitor.

4 Please note:

- If the sonar is switched off uncontrolled with the transducer in its lowered position, the transducer will normally be hoisted automatically after approximately one minute. You must however verify that this takes place. If the transducer is not hoisted automatically, it can be raised manually by means of the hoist/lower switch in the Motor Control Unit. If mains power is lost, you can also use the hand crank provided.

How to perform basic operations

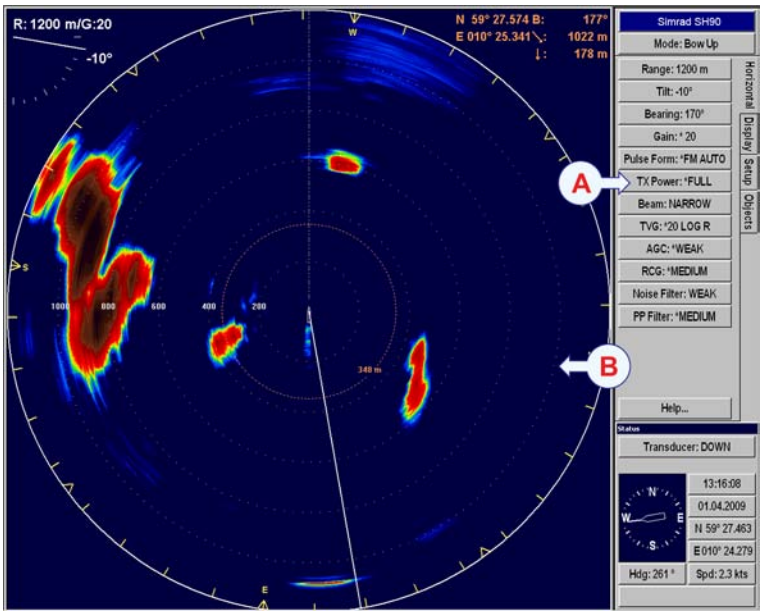
Observe this brief procedure to familiarize yourself with the basic operations with echo presentations and menu operations.

Echo presentation and menu

1 Once the sonar system is up and running, observe the layout of the display presentation:

- On the right side, observe the menu system (A).
- On the left side, observe the sonar echo presentation (B).

Figure 10 Basic menu (A) and echo presentation (B)



2 On the Operating Panel, press the **Menu** button (located above the large trackball).

3 On the display, observe that the menu disappears.

When the menu is removed the echo presentation is extended to cover the entire display.

4 Use the trackball, and move the cursor over to the left or right side of the display.

5 Observe that the menu reappears on the selected side, and that the remaining echo presentation area is not re-scaled.

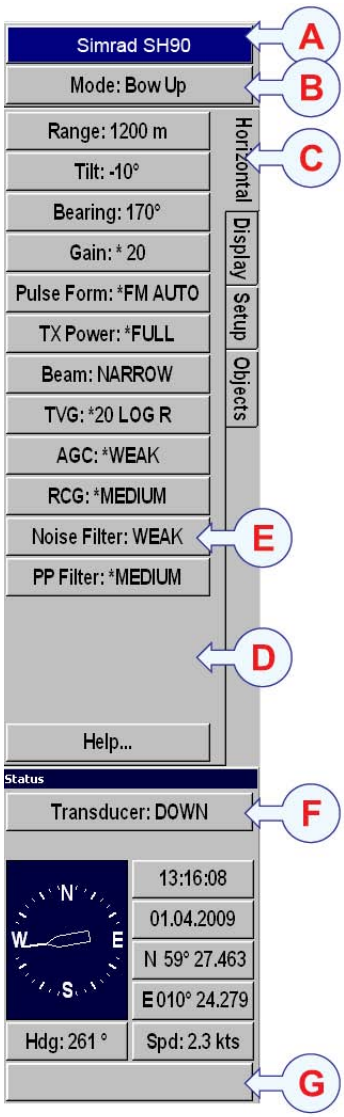
6 Move the cursor towards the centre of the display, and observe that the temporary menu disappears.

7 On the Operating Panel, press the **Menu** button one more time, and observe that the menu reappears.

The menu structure

The menu contains several different buttons, tabs and parameter dialogs.

Figure 11 Menu structure



A **Sonar type**: This field simply states the name of the sonar.

B **Mode**: Click here to change display mode. If you click on the middle of the button you will open a dedicated menu for mode selection. If you click on the right or left side of the button you can scroll through the available modes.

C **Tab**: Click on a tab to bring forward the menu.

D **Menu**: This is the body of the menu. Each menu holds one or more buttons.

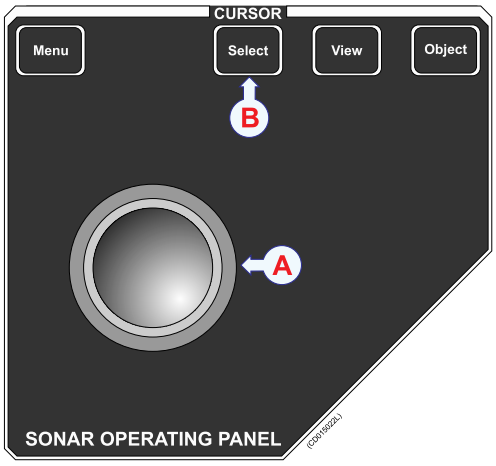
E **Button**: Click on a button to change the applicable parameter. If you click on the middle of the button you will normally open a dedicated parameter dialog for parameter selection. If you click on the right or left side of the button you can scroll through the available choices.

F **Parameter dialog**: When you click a button, the relevant parameter dialog opens at the bottom of the menu. Each parameter dialog holds one or more buttons or menus. To close a parameter dialog, click the **Close** button. Most dialogs provide a **Help** button for access to the on-line help. In this example you can see the **Status** dialog, which is replaced when a parameter dialog is opened.

G **Messages**: The button at the bottom of the menu is used to provide messages from the sonar system.

→ *Messages* on page 114

Control the cursor



Operate the trackball (A) on the Operating Panel.

Observe that the cursor moves on the sonar display, and that it changes its form depending on its location.

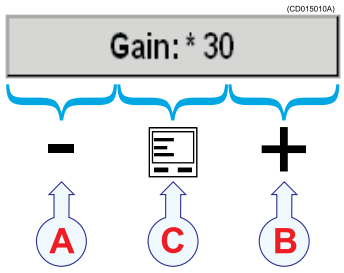
Observe the location of the **Select** button (B). Press this button to make a selection.

The **View** and **Object** buttons above the trackball are used to open specific menus.

Menu buttons

Each menu contains several buttons. Each button shows both the function and the current parameter. The majority of the buttons in each menu field have three functions:

- You can select a lower parameter value.
- You can select a higher parameter value.
- You can open the applicable parameter dialog.



A *Click here to decrease the parameter value*

B *Click here to increase the parameter value*

C *Click here to open the parameter dialog.*

Use the trackball on the Operating Panel, and position the cursor over the left side of the button (A). Observe that the shape of the cursor changes to a “minus” sign. This means that the value of the parameter will decrease when you press the **Select** button on the Operating Panel.

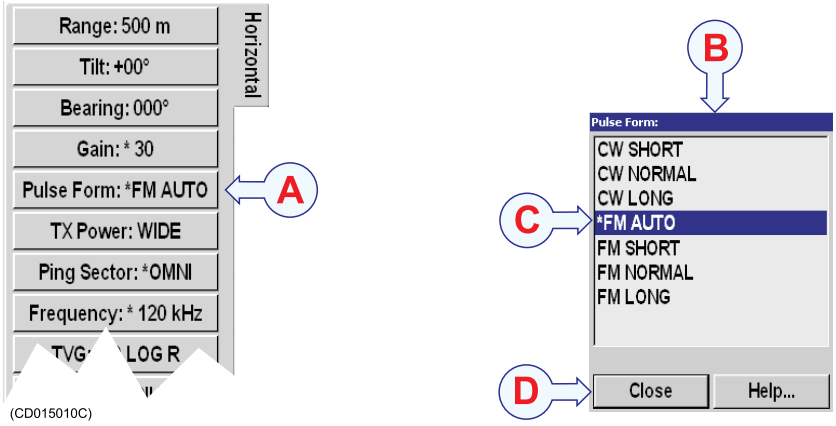
Position the cursor over the right side of the button (B). Observe that the shape of the cursor changes to a “plus” sign. This means that the value of the parameter will increase when you press the **Select** button.

Position the cursor on the centre of the menu button (C). Observe that the shape of the cursor changes to a “menu” symbol. This means that the applicable parameter dialog will open when you press the **Select** button. The dialog appears in the lower part of the menu field.

Changing a parameter value

Observe this generic procedure to change a parameter value. Once you have gained more experience, and have become more familiar with the available options, you will select the parameters directly from the buttons.

Figure 12 Changing a parameter value



1 Move the cursor to the middle of the menu button (A). Observe that the cursor changes its shape to a menu symbol.

2 Press the **Select** button on the Operating Panel.

3 Observe that the corresponding parameter dialog (B) opens at the bottom of the menu.

4 Move the cursor down to the dialog, position the cursor over the requested parameter value (C), and press the **Select** button again.

5 Observe that the change you have requested takes immediate effect on the sonar.

- This makes it easy to test the effect of each parameter setting. Note however that transceiver related parameters will first be operational in the next ping.

6 Move the cursor down to the **Close** button (D), and press the **Select** button again.

7 Observe that the parameter dialog closes.

Note

*In this manual, the phrase "Click the button" means that you shall position the cursor over the menu button, and then press the **Select** button on the Operating Panel.*

Certain parameter settings are identified with an asterisk (*). This symbol indicates the default setting known to perform well under normal conditions. If you get "lost" in the parameter settings, the **Default settings** function will bring up these normal parameters. The **Default setting** function is available on the **Setup** menu, and a dedicated parameter dialog is used.

In the Simrad SH90 sonar, all parameters are stored. This function will cause the sonar to remember all the selected parameter settings, even when the sonar is switched off.

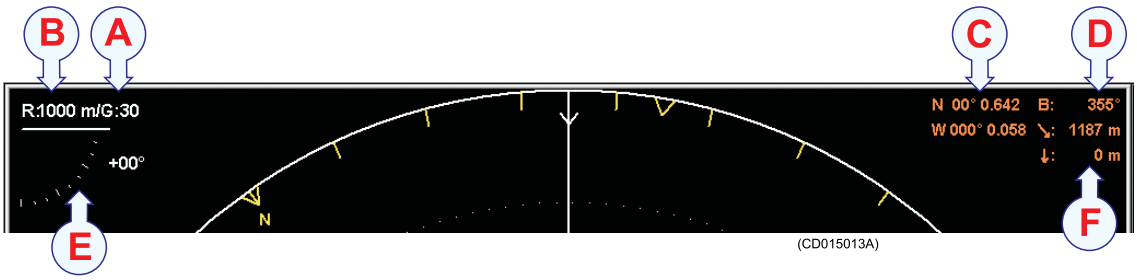
Visual aids

The sonar display contains not only the sonar picture and the menu system, but also other information that is useful for efficient operation.

Common information on the display

In nearly all display modes, the following information is provided.

Figure 13 Visual aids



A *Current horizontal gain.*

B *Current horizontal range.*

C *The cursor's current geographical position (provided that the necessary sensor is connected to the sonar).*

D *The cursor's current bearing relative to the vessel or true north.*

E *Current tilt.*

F *Current range and depth of the cursor position.*

Moving the boundary lines

In most display modes with multiple views, the size of each view can easily be modified by moving the boundary line between the views. Observe the following procedure:

1 Place the cursor on the boundary line. Observe that it changes its shape to a double arrow (↔).

2 Press and hold the **Select** button on the Operating Panel.

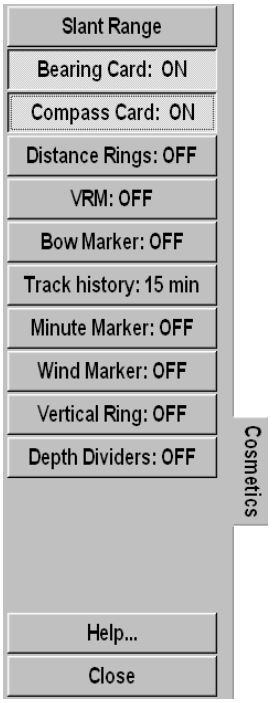
3 Move the cursor with the **Select** button depressed. Observe that the boundary line is moved.

4 Release the **Select** button.

5 Observe that the boundary line has been relocated to the new cursor position.

Cosmetics

The choices in the **Cosmetics** menu allows you to enable or disable a range of visual aids in the sonar picture.



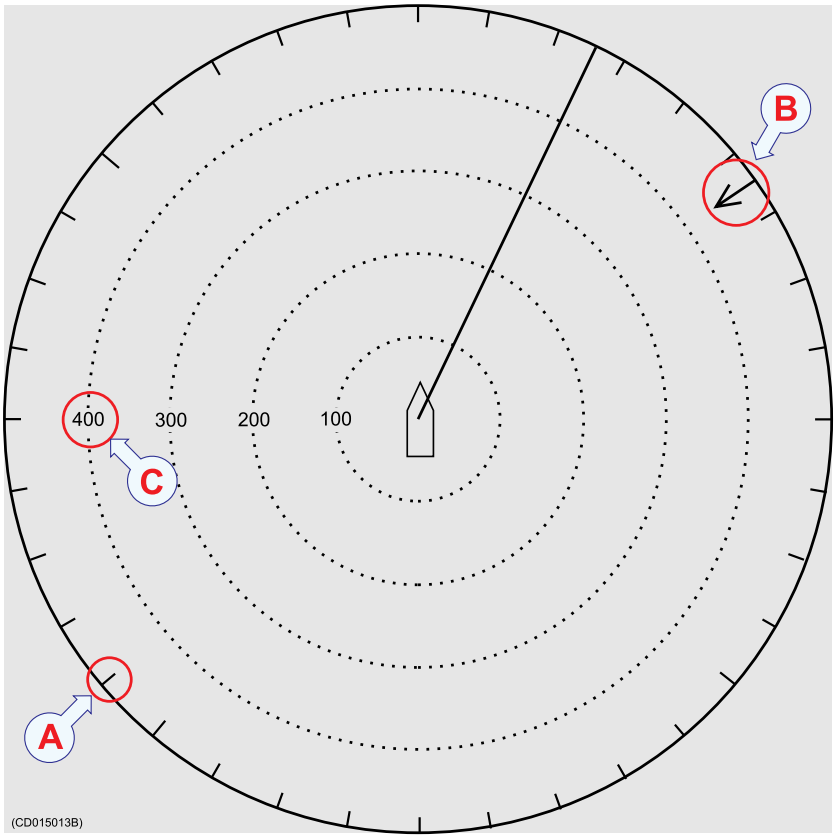
1 Click the **Display** tab to open the **Display** menu.

2 Click the **Cosmetics** button to open the **Cosmetics** menu.

3 Observe a range of parameters available to provide you with additional information on the sonar picture.

- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

Figure 14 Bearing Card (A), Wind Marker (B) and Distance Rings (C)

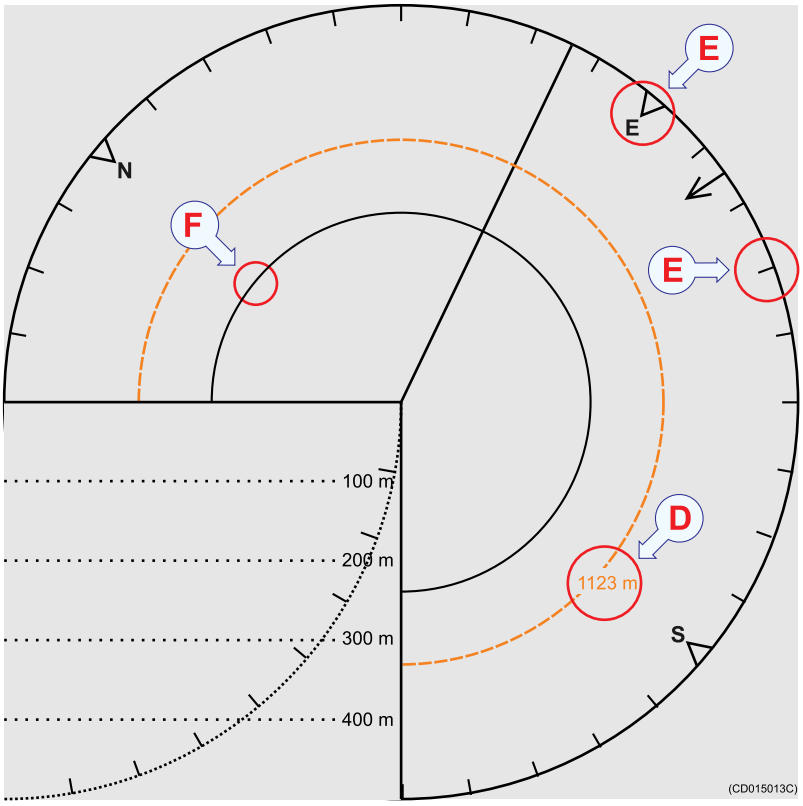


The **Bearing Card** (A) shows the current bearing relative to the vessel. The markers are shown as short white lines for every 10th degree along the outer circle of the sonar view.

The **Wind Marker** (B) is shown as an arrow drawn from the Compass card pointing towards the centre of the display. If a wind sensor is connected to the sonar, it will automatically show the current wind direction. Otherwise, the wind direction may be entered manually. The arrow has a fixed length, it is not scaled according to the current wind speed.

The **Distance Rings** (C) are shown as dotted rings, each with a range read-out on the left hand side of the display centre.

Figure 15 Variable Range Marker (D), Compass Card (E) and Vertical Ring (F)

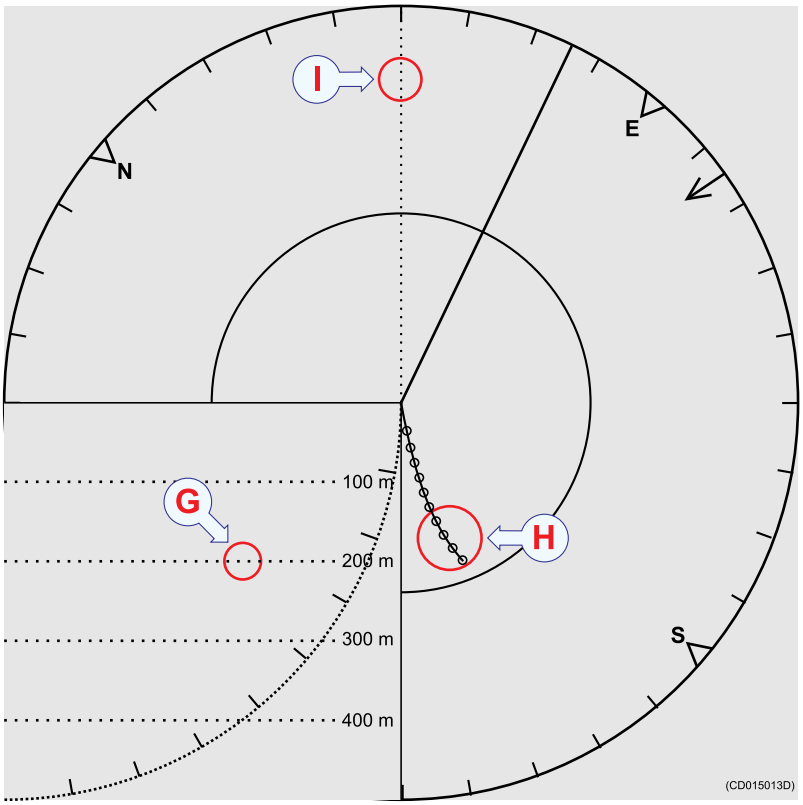


The **Variable Range Marker (VRM)** (D) consists of an adjustable range ring with range read-out. It can be used for any type of distance marking relative to the vessel. To adjust the marker, locate the cursor on the marker ring, press the **Select** on the Operating Panel, and move the cursor with the **Select** button depressed. When the button is released, the variable range marker radius will be locked to the new position.

The **Compass Card** (E) is shown as short yellow lines for every 10th degree along the outermost circle of the sonar view. A triangle symbol indicates each 90th degree. It has labels indicating North, East, South and West. It is updated when the heading of own ship has changed more than 1 degree.

The **Vertical Ring** (F) shows the selected range of the vertical slice as a full circle in the horizontal presentation. This is an indication of which distance a target should be presented in the vertical view. The Vertical Ring will only be visible in those modes that support a vertical slice.

Figure 16 Depth Dividers (G), Minute Markers (H) and Bow Marker (I)



The **Depth Dividers** (G) are horizontal dotted lines used to visualize the depth steps in the vertical slices.

The **Minute Markers** (H) are shown as small circles on the track history of the ship.

The **Bow Marker** (I) is heading marker. It is a dotted line drawn from the bow of your own ship.

On-line help

The Simrad SH90 sonar is equipped with a comprehensive on-line help system. Help is provided in two levels: *On-line* and *Free*. It is available from all the parameter dialogs and menus by clicking the **Help** button.

Once pressed, the first help text will appear in the bottom of the menu. This is the *On-line* text. It is short, context sensitive, and designed not to interrupt the operation of the sonar. To close the **Help** parameter dialog, click the **Close** button.

To access more detailed information, click the **Free** button. This will open the complete interactive manual. It contains the same information as the printed *SH90 Reference Manual*, but the

information is made available using the menu on the left hand side and interactive links throughout the document. Click **Free** in the bottom left corner to return to the small on-line parameter dialog, or **Close** to exit the interactive manual.

Note

*If you click **Close** button to close the large interactive manual (Free), this manual will automatically reappear the next time you click a **Help** button.*

OPERATIONAL PROCEDURES

This chapter presents how to perform the most common procedures on the SH90 sonar. Note that the power on/off procedures have been previously explained.

Topics

- *Power on/off procedures* on page 38
- *Menu procedures* on page 40
- *Gain adjustment procedures* on page 41
- *Mode procedures* on page 43
- *Markers and symbols procedures* on page 45
- *Storage procedures* on page 48
- *Automatic search and tracking procedures* on page 54
- *User setting procedures* on page 57
- *Installation of options* on page 58
- *Software procedures* on page 60

Power on/off procedures

These procedures explain how to switch the sonar system on and off. The operation is made using the buttons on the operating panel.

Figure 17 Operating Panel

How to switch on the sonar

This procedure explains how to power up the Simrad SH90.

1 Press the **Power** button on the colour display monitor.

2 Press the **Power** button on the Operating Panel, and keep it depressed for approximately two seconds.

- The green lamp on the right side of the button will flash to indicated that the power has been switched on, and that the computer is starting up.

- After a short period you will see the sonar picture on the display.
- If the sonar system has been disconnected from AC power, the Processor Unit must be started manually. Use the on/off switch behind the lid on the front panel.

3 Check that the water depth beneath the keel is sufficient to lower the transducer.

4 Press the **Down** button on the control panel to lower the transducer.

- The green lamp next to the button will flash, and an audible signal indicates that the transducer is lowered.
- When the lower position has been reached, the lamp will be lit continuously, the audible signal stops, and the top button in the **Status** parameter dialog shows **Transducer:Down**.
- By default the transmit power is disabled when the sonar is powered up. This is for safety reasons. On the **Horizontal** menu, you will see that the **TX power** button flashes to remind you of this.

5 Click the **TX power** to select **Full**.

How to switch off the sonar

This procedure explains how to power off the Simrad SH90.

1 Press the **Up** button on the Operating Panel.

- The green lamp next to the button will flash, and an audible signal indicates that the transducer is hoisted.
- When the upper position has been reached, the lamp will illuminate continuously, the audible signal stops, and the upper button in the **Status** menu shows **Transducer: UP**.

2 Press the **Power** button on the Operating Panel, and keep it depressed for approximately two seconds.

3 Switch off the display monitor.

4 Please note:

- If the sonar is switched off uncontrolled with the transducer in its lowered position, the transducer will normally be hoisted automatically after approximately one minute. You must however verify that this takes place. If the transducer is not hoisted automatically, it can be raised manually by means of the hoist/lower switch in the Motor Control Unit. If mains power is lost, you can also use the hand crank provided.

Menu procedures

This section provides general procedures for menu handling.

How to hide the menu

The menu is normally located on the right hand side of the display, but if you don't need it, you can easily remove it.

1 Press the **Menu** button on the Operating Panel.

The **Menu** button acts as a toggle switch. Press once to remove the menu, and one more time to retrieve it.

Alternative method

1 Click the **Display** tab on the sonar menu.

2 Click the **Full screen: On** button.

How to recall the menu

1 Move the cursor to the far left or far right side of the display

2 Observe that the menu system appears. It can be shown on either side, and will not affect the sonar picture.

3 Open the **Display** menu, and click **Full screen: Off**.

How to simplify the menu

This procedure explains how you can easily reduce the number of buttons on the sonar menus. This can be useful if you never use them.

1 Click the **Display** tab to open the **Display** menu.

2 Click the **Menu** button.

3 In the parameter dialog, select the menu level you wish to use.

4 Click **Close** to exit.

Gain adjustment procedures

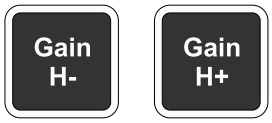
This section explains how to control the manual and automatic gain settings on the SH90 sonar.

How to adjust the gain

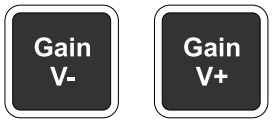
You can adjust the sonar gain by means of the control buttons on the Operating Panel, or by using the **Gain** button on the **Horizontal** and **Vertical** menus.

1 On the Operating Panel, locate the **Gain** field.

2 Press the **Gain H+** or **Gain H-** buttons to increase or decrease the gain in the horizontal presentation.

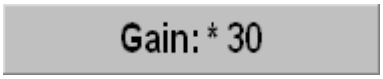


3 Press the **Gain V+** or **Gain V-** buttons to increase or decrease the gain in the vertical presentation.



Alternative method

1 In the sonar's menu system, click the **Gain** button on the **Horizontal** or **Vertical** menus to adjust the gain.



Click the left or right side of the **Gain** button to decrease or increase the gain, or the middle of the button to open the parameter dialog.

For more information about this parameter, see *About Gain* on page 180.

How to adjust the AGC

The **AGC** (Automatic Gain Control) adjusts the gain in the sonar's preamplifier circuitry. This gain depends on the strength of the incoming echo signal. The result is a filter effect, reducing noise and reverberation. The **AGC** has four different settings.

1 Click the **Horizontal** or **Vertical** tab to open the respective menu.

2 Click the **AGC** button to adjust the parameter.

Click the left or right side of the **AGC** button to decrease or increase the setting, or the middle of the button to open the parameter dialog.

For more information about this parameter, see *What is AGC?* on page 179.

How to adjust the RCG

The **RCG** (Reverberation Controlled Gain) regulates the receiver gain individually for each of the receiving beams. If you select a small or medium value, echoes from propellers, surface and bottom reverberations will be suppressed, while target echoes will remain in view. If you select a strong filter setting, it will remove the bottom, while echoes on the bottom will be presented.

Note

Scattered fish can be perceived as reverberation. The RCG function must therefore be used with care if you wish to find scattered schools.

1 Click the **Horizontal** or **Vertical** tab to open the respective menu.

2 Click the **RCG** button to adjust the parameter.

Click the left or right side of the **RCG** button to decrease or increase the setting, or the middle of the button to open the parameter dialog.

For more information about this parameter, see *What is RCG?* on page 181.

How to adjust the TVG

The **TVG** (Time Varied Gain) controls the gain in the signal amplifier. The gain is weakest just after the ping, and increases in accordance with time (and therefore range). A number of standard gain curves are available, as well as *Off*. By using TVG, the gain is adjusted in such way that a school of fish will be presented with approximately the same strength on the screen in any position inside the regulated TVG range of 1000 meters.

1 Click the **Horizontal** or **Vertical** tab to open the respective menu.

2 Click **TVG** to adjust the parameter.

Click the left or right side of the **TVG** button to choose a setting, or the middle of the button to open the parameter dialog.

For more information about this parameter, see *What is TVG?* on page 178.

How to adjust the display gain

The **Display Gain** increases or decreases the strength of the echo presentation on the display.

1 Click the **Display** tab to open the **Display** menu.

2 Click the **Display gain** button to adjust the parameter.

Click the left or right side of the **Display gain** button to decrease or increase the setting, or the middle of the button to open the parameter dialog.

Mode procedures

This section explains how to choose operational modes, and how to set up the **Mode** buttons on the SH90 Operating Unit.

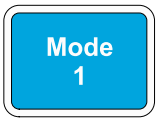
The various modes are described in chapter *Display modes* on page 68.

How to select operational mode

Your SH90 sonar is equipped with several operational modes. Observe these procedures to choose the mode best fit for your current operations.

1 Locate the **Mode** field on your Operating Panel

2 Press one of the four buttons to choose mode.



Alternative method

1 Locate the **Mode** button on the top of each menu.

2 Click the **Mode** button to choose operational mode.

Click the left or right side of the **Mode** button to choose mode, or the middle of the button to open the parameter dialog.

How to define the function of the Mode buttons

The **Mode** buttons on your SH90 Operating Panel can either be used to select operational mode, or user settings. You can switch between these options.

1 Click the **Display** tab to open the **Display** menu.

2 Click the **Mode Buttons:** button to select *Mode* or *User*.

How to sort the operational modes

Your SH90 sonar provides you with a selection of operational modes. This list of modes can be sorted to suit your preferences. The top four modes on your list can be chosen by pressing the four **Mode** buttons on the Operating Panel.

1 Click the **Setup** tab to open the **Setup** menu.

2 Click the **Sort Modes** button to open the **Sort Modes** menu.

The **Sort Modes** menu lists all the available modes in their current order.

3 Click one of the operational modes.

Observe that the **Move down** and/or **Move up** buttons at the bottom of the menu are activated.

4 Click the **Move down** or **Move up** button to move the chosen operational mode down or up the list.

5 When the list has been arranged in the order you wish to keep, click **Apply**.

The current order is saved automatically.

6 Click **Close** to exit.

Markers and symbols procedures

This section explains how to add, investigate and delete symbols and markers on the SH90 sonar presentation.

How to add 'Target' and 'Circle' markers

1 Move the cursor on the sonar picture, and position it wherever you wish to place the marker.

2 Press the requested marker button in the **Symbol** field on the Operating Panel to place the marker.

About Target markers

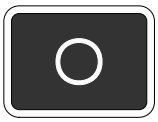
This button places a **Target marker** at the cursor location.

A triangular symbol with a corresponding number will appear on the screen over the target, while position data for the defined marker is displayed in the **Objects** menu.

- The system continues to track the markers even when outside the sonar range.
- The **Target marker** button can also be used for manual target tracking as the system is designed to calculate the speed, course and distance between the last two chosen targets.
- These target marker data are displayed in white figures for 15 minutes in the lower right hand corner of the horizontal presentation.
- This function is also an effective method for determining the distance between two selected points on the screen.

About Circle markers

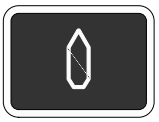
This button places a **Circle marker** at the cursor location.



A circular symbol will appear on the screen at the chosen location. The size of the symbol is equal to that of the purse seine selected. This marker may be used to estimate the size of a school of fish or as an indication of the size of the purse seine.

How to add an 'Own ship' symbol

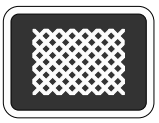
1 Press the **Own ship** button in the **Symbol** field on the Operating Panel.



The square **Own ship symbol** is placed on the screen at the vessel's current location.

How to add a 'Gear' symbol

1 Press the **Gear** button in the **Symbol** field on the Operating Panel.



The gear symbol will either be a purse seine circle or a trawl symbol depending on the parameter chosen by the **Gear** button in the **Setup** menu. The selected gear symbol will be displayed in yellow.

How to use the seine circle

1 Press the **Gear** button on the Operating Panel.

The purse seine circle will appear on the forward end of the ship symbol on the corresponding side of the vessel selected in the **Setup** menu. The circle will follow the vessel's movements.

2 At the moment the seine is shot, press the **Gear** button again.

The purse seine circle will remain stationary and indicate the ideal path for setting the seine. Three square symbols on the ship's course line indicate the: shooting, one half, and the end of the seine positions. Three different nets can be defined if you click **Gear** on the **Setup** menu.

3 Press the **Gear** button to delete the purse seine circle.

How to use the trawl symbol

This is a useful aid in providing an overview of the trawl operation. Trawl data can be set manually using the menu or automatically by interfacing a Simrad FS trawl sonar or Simrad ITI trawl monitoring system with the sonar.

In the manual mode the trawl symbol will be displayed with the selected size, depth and distance. When the FS70, FS900 or FS3000 trawl sonar is connected, the trawl symbol will automatically be displayed with the correct depth in the vertical modes. When the ITI trawl system is connected, the trawl symbol will be displayed with the correct distance, bearing and depth. If required, the trawl opening, ambient water temperature, and trawl-filling indicator may also be displayed. This is assumed that the proper sensors are connected to the ITI system.

How to define and change the gear properties

The gear properties are changed by means of the **Gear** button on the **Setup** menu.

1 Click the middle of the **Gear** button to open the parameter dialog.

2 Click once on the gear you wish to use.

3 Click the **Edit** button at the bottom of the **Gear** parameter dialog.

4 For each of the gear parameters available, select the requested value.

5 Click **Close** when all the parameters have been defined.

How to investigate marker and symbol information

1 Click the **Objects** tab to open the menu.

2 Observe that all the current objects (markers and symbols) are listed.

- The **Objects** menu is shown in all display modes, and displays the range (R), bearing (B) and depth (D) to all selected objects.

- The identification (ID) abbreviations for the different objects are:
  - AT: Automatic target track marker
  - Ci: Circle marker
  - M: Target marker
  - OS: Own Ship marker
  - PT: Position track marker
  - F: Radio buoy marker
- The number behind the ID abbreviation refers to the same number on the object in the sonar presentation. The "P" after the Automatic target track marker indicates the priority level where the audio channel is locked to the target.
- When you select a **Target marker**, **Automatic target track marker**or a **Radio buoy marker** in the list, a dotted bearing line from the vessel to the marker will be shown.

3 To retrieve the information about an object, click the object abbreviation in the list.

4 Observe that a dedicated parameter dialog with all known object information appears at the bottom of the menu.

How to delete a marker or symbol

1 Click the **Objects** tab to open the menu.

2 Click on the object that you wish to delete.

3 Click the **Delete** button at the bottom of the list.

Alternative method

1 Place the cursor on the object.

2 Press the **Object** button on the Operating Panel (or the right mouse button)

3 Click **Delete** on the menu.

Storage procedures

This section explains how to store and recall sonar images on the SH90.

How to store sonar images

Note that the **Record** button on the Operating Panel can be pressed at any time to start recording. It is not necessary to open the **Store/Recall** menu first. When this button is used, the currently selected recording mode will be used.

Prepare the recording parameters

1 Click the **Setup** tab to open the menu.

2 Click the **Store/Recall** button to open the **Store/Recall** menu.

3 Click the **Store mode** button to choose recording mode.

Click the left side of the **Store mode** button to scroll down the list of options. Click the middle of the button to open the parameter dialogue for direct access to the requested setting, or click the right side of the button to scroll up the list of options.

4 Record the images.

5 Click the **Close** button to close the **Store/Recall** menu.

Once the recording has been activated, the sonar will save sonar images as defined by the **Store mode** setting. Each image is added to the list of temporary files located below the buttons. Each file name reflects the date and time.

Record a single image

1 To record a single image:

A Click the **Store** button.

or

B Press the **Record** button on the Operating Panel.

2 Observe that the message field below the menu displays the image file name on a green background.

Record multiple images

1 To start recording:

A Click the **Store** button.

or

B Press the **Record** button on the Operating Panel.

2 Observe that the message field below the menu displays the image file names on a green background.

3 To stop recording:

A Click the **Store** button.

or

B Press the **Record** button on the Operating Panel.

How to recall sonar images

Observe the following procedure to recall sonar images.

Preparations

1. Click the **Setup** tab to open the menu.
2. Click the **Store/Recall** button to open the **Store/Recall** menu.

3. Observe the list of images in the **Store/Recall** menu.

To recall a single image

1. Click the **Recall mode** button, and select **Single shot**.

2. Click one of the images to select it.
3. Click the **Recall** button to view the image.

   The chosen image will be displayed. The phrase “RECALL” is used to indicate that a recalled image has replaced the sonar image.
4. Click the **Object** button on the Operating Panel to restore normal operation.

To recall several images

1. Click the **Recall mode** button, and select how long time you wish to see each image.

2. To select a number of images files, click the top file, then hold the **Select** button on the Operating Panel depressed while you move the cursor down to select the other files in the field.
3. Click the **Recall** button to view the images.
   - The chosen images will be displayed, one by one. The phrase “RECALL” is used to indicate that a recalled image has replaced the sonar image.
   - When all images has been displayed, the sonar will automatically resume normal operation.

How to keep sonar images

When you store new sonar images, they will by default be added to the list of **Temporary files**. This list will contain maximum 100 images, and when this limit has been reached, the oldest files will be automatically removed.

1. Click the **Setup** tab to open the menu.
2. Click the **Store/Recall** button to open the **Store/Recall** menu.
3. Observe the list of images in the **Store/Recall** menu. There are two lists, one for temporary files, and one for permanent.
4. Click one of the images in the **Temporary files** field to select it.
5. Click the arrow on the top of the **Permanent files** field to move the selected image down.

The **Permanent files** list does not limit the number of files it can contain. This is however limited by the storage capacity of the hard disk in the Processor Unit.

How to delete sonar images

1. Click the **Setup** tab to open the menu.
2. Click the **Store/Recall** button to open the **Store/Recall** menu.
3. Observe the list of images in the **Store/Recall** menu.
4. Click one of the images to select it.
5. Click the **Delete** button at the bottom of the file fields to delete the selected image.

How to rename sonar images

1. Click the **Setup** tab to open the menu.
2. Click the **Store/Recall** button to open the **Store/Recall** menu.
3. Observe the list of images in the **Store/Recall** menu.
4. Click one of the images in the **Permanent files** field to select it.
5. Click the **Rename** button below the files to rename the selected image.
   - Observe that a parameter dialogue opens to present the current file name.
   - Observe that an on-screen keyboard opens to allow you to enter characters.
6. Place the cursor at the beginning of the current file name, and click the **Del** (Delete) button on the on-line keyboard to remove the characters in the current file name.
   - Make sure that you do not delete the file name extension **.bmp**.

7 Click the necessary characters on the on-line keyboard to build a new file name.

8 Click the **Close** button in the parameter dialogue when you have completed the new file name.

Figure 18 On-screen keyboard

On-Screen Keyboard
File Keyboard Settings Help
esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 psc slk brk
| 1 2 3 4 5 6 7 8 9 0 + \ bksp ins hm pup nlk / * -
tab q w e r t y u i o p å ¨ ' del end pdn 7 8 9 +
lock a s d f g h j k l ø æ ent 4 5 6
shft z x c v b n m , . - shft 1 2 3 ent
ctrl alt alt ctrl 0 .

You are also permitted to change the file name on images in the **Temporary files** field. However, if you wish to transfer the chosen image to the **Permanent files** field afterwards, you will find that the new file name is changed by the transfer process.

How to print sonar images

1 Click the **Setup** tab to open the menu.

2 Click the **Store/Recall** button to open the **Store/Recall** menu.

3 Observe the list of images in the **Store/Recall** menu.

4 Click one of the images to select it.

5 Click the **Print** button below the files to print the selected image.

The image will be sent to the default printer connected to the Processor Unit. You are not allowed to control the output size and format.

How to burn sonar images on a CD

The SH90 Processor Unit is provided with a CD player capable of burning blank CDs. Observe the following procedure to burn selected sonar images on a blank CD. Do not attempt this while the sonar is in use searching for fish!

Note

This procedure assumes that you have basic knowledge of file management in Windows.

To access the operating system functions, you can click any **Help** button. When the help window opens, you can also access the **Taskbar** with the **Start** button.

1 Insert a blank recordable CD in the Processor Unit.

2 Observe that the operating system's auto-start function opens a dialogue requesting guidance.

3 Select **Open writable CD folder using Windows Explorer**, and click **OK**.

4 Observe that a **Windows Explorer** window opens.

5 By means of normal Windows functions, navigate to the folder *d:/winson/screendumps*.

6 Double-click to open sub-folder *Permanent* or *Temporary*.

7 Click to select the images you wish to burn on the CD, and copy them to the CD's **Windows Explorer** window.

8 Click **Write these files to CD** in the **Windows Explorer** window, and wait until the process has finished.

9 Remove the CD, and close the **Windows Explorer** window.

How to copy sonar images to a USB memory stick

The SH90 Processor Unit is provided with several USB interface ports. These are located on the rear side of the cabinet, and on some models below the CD player under the front cover. Observe the following procedure to copy selected sonar images over to a USB memory stick. Do not attempt this while the sonar is in use searching for fish!

Note

This procedure assumes that you have basic knowledge of file management in Windows.

1 Insert a USB memory stick into the Processor Unit.

2 Observe that the operating system's auto-start function opens a dialogue requesting guidance.

3 Select **Open Windows Explorer**, and click **OK**.

4 Observe that a **Windows Explorer** window opens.

5 By means of normal Windows functions, navigate to the folder *d:/winson/screendumps*.

6 Double-click to open sub-folder *Permanent* or *Temporary*.

7 Click to select the images you wish to copy to the USB memory stick, and copy them to the USB's **Windows Explorer** window.

8 Remove the USB memory stick, and close the **Windows Explorer** window.

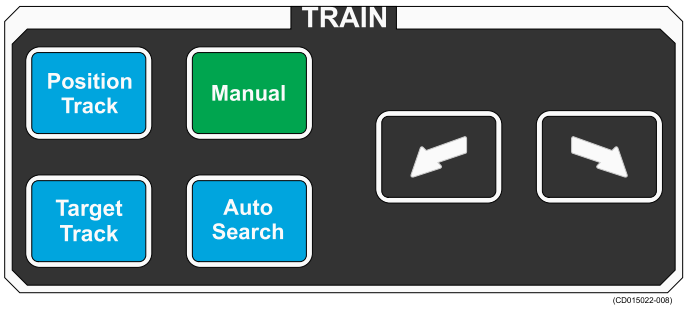
To access the operating system functions, you can click any **Help** button. When the help window opens, you can also access the **Taskbar** with the **Start** button.

Automatic search and tracking procedures

The SH90 sonar provides you with two automatic search programs, horizontal and vertical. Both are initiated from the Operating Unit

How to start the horizontal search program

Observe the following procedure to run the automatic search program.



Procedure

1. Press the **Auto search** button in the **Train** field on the Operating Panel to start the horizontal search program.
2. Hold the **Auto search** button depressed while you also press one of the two **"arrow"** buttons in the **Train** field.
3. Observe that the opening angle of the search sector is adjusted accordingly.
4. Release the **Auto search** button, press and hold one of the two **"arrow"** buttons.
5. Observe that the centre of the search sector is trained accordingly.

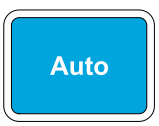
To exit the search program, press the **Manual** button.

How to start the vertical search program

Observe the following procedure to run the automatic search program.

Procedure

1. Press the **Auto** button in the **Tilt** field on the Operating Panel to start the vertical search program.



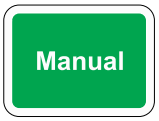
2. Hold the **Auto** button depressed while you also press one of the two **"arrow"** buttons in the **Tilt** field.

3 Observe that the vertical opening angle of the search sector is adjusted accordingly.

4 Release the **Auto** button, press and hold one of the two **"arrow"** buttons.

5 Observe that the centre of the vertical search sector is adjusted accordingly.

6 To exit the search program, press the **Manual** button.



How to enable position track

Observe this procedure to initiate a position track.

1 Place the cursor over the desired location.

2 Press the **Position track** button in the **Train** field on the Operating Panel.

A geographically fixed circle will appear on the display, and its position will automatically be tracked by the system with respect to the bearing and tilt angle. The track parameters can be investigated by accessing the **Objects** menu. When the *Auto Tilt* function is activated in the *Position Track* mode the tilt search centre is automatically adjusted with regard to the distance to the tracked position.

How to enable target track

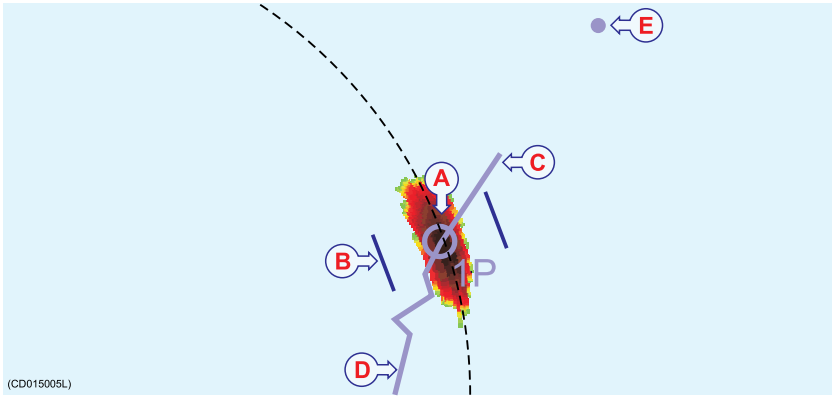
Observe this procedure to initiate a target track.

1 Place the cursor over the desired target.

2 Press the **Target track** button in the **Train** field on the Operating Panel.

A circle with dedicated identification (A) will appear on the display and its position will automatically be tracked by the system using the strongest echo centred in the track window (B) represented by the two bars on the audio line. The size of the track window may be selected using the **Track Window** button in the **Setup** menu.

Figure 19 Target tracking with related symbols



The vector (C) originating from the target's centre indicates its course and speed. The length of the vector increases relative to the target's speed. One knot is represented by a small mark on the vector. A course line (D) can also be displayed showing the target's track. A point ahead of the target indicates you position after a given time, and this time can be set using the **Movements** button on the **Setup** menu. Target tracking symbols and data are displayed with a light violet colour.

How to add a target tracking line

Observe this procedure to add a tracking line to a tracked target to indicate its movement history.

Procedure

1 Choose an operational mode with a horizontal presentation.

2 Place the cursor in the horizontal presentation.

3 Press the **View** button in the **Cursor** field on the Operating Panel.

4 Observe that a short-cut menu appears on the display.

5 Click **View Menu**, and observe that the **GeoView** menu opens.

6 Click the **Target track** button on the **GeoView** menu.

7 Observe that the **Target track** parameter dialog opens below the menu.

8 Choose the length of the tracking line, and click **Close** to exit.

User setting procedures

This section explains how to handle user and default settings on the SH90 sonar.

How to save the current user setting

1 Click the **Setup** tab to open the menu.

2 Click the **User setting** button to open the parameter dialog.

3 Click the **Save current setting** button.

The current setting is saved with the default identification name.

How to load a user setting

1 Click the **Setup** tab to open the menu.

2 Click the **User setting** button to open the parameter dialog.

3 Click the desired user setting to select it.

4 Click the **Load** button.

5 Click **OK** in the next parameter dialog to confirm the selection.

The selected setting is loaded.

How to rename a user setting

Note

*In principles you can use any name, but the **Mode** buttons on the Operator Panel will only choose from User 1, User 2, User 3 and User 4. These names must also be on the top of the list. If you wish to add users, apply names like for example "User 5 Charlie".*

1 Click the **Setup** tab to open the menu.

2 Click the **User setting** button to open the parameter dialog.

3 Click the one of the user settings on the list to select it.

4 Click the **Rename** button.

- Observe that a parameter dialog opens to present the current name.

- Observe that an on-line keyboard opens to allow you to enter characters.

5 Place the cursor at the beginning of the current name, and click the **Del** (Delete) button on the on-line keyboard to remove the characters.

6 Click the necessary characters on the on-line keyboard to build a new name.

7 Click the **OK** button in the parameter dialog when you have completed the new name.

8 Click the **Close** button in the **User Setting** parameter dialog when you have completed the procedure.

The new name is saved automatically.

How to delete a user setting

1 Click the **Setup** tab to open the menu.

2 Click the **User setting** button to open the parameter dialog.

3 Click the desired user setting to select it.

4 Click the **Delete** button.

5 Click **OK** in the next parameter dialog to confirm the selection.

The selected user setting is deleted.

How to load the factory settings

1 Click the **Setup** tab to open the **Setup** menu.

2 Click the **Default setting** button.

3 Click **OK** in the next parameter dialog to confirm the action.

The factory settings are loaded and implemented.

Installation of options

Optional functionality may be added to the SH90.

All options are pre-programmed into the standard sonar version. When ordering a permanent option installation, a code word will be released from Simrad. For installation of options, observe the following procedures.

How to access the Install Options dialog

1 Select the **Setup** menu.

2 Click the **Test** button to open the **System test** menu.

3 Click the **Installation Menu** button.

4 Observe that the installation menu bar is shown on the top of the screen.

5 Click **Options →Install options**.

6 Observe that the **Install Options** parameter dialog opens.

'Install Options' parameter dialog

The following parameters are available in the **Install options** parameter dialog.

- **HWID**: This field displays the unique 12-character hardware identification code. This code is different for each SH90 sonar. Simrad uses this code to generate the 32-character code word used for a permanent option installation.
- **Add License String**: This button is used for permanent installation of the chosen option. When you press the button, this will activate the on-screen keyboard used to type the required 32-character code word.

Adding optional functionality

To add an option permanently

1 Obtain the option code as follows:
   1 Open the **Install Options** parameter dialog, and write down the **HWID** number.
   2 Send the **HWID** number to your dealer. Makes sure that you write down the character string correctly!
   3 Use the sonar without the option until your dealer approaches you with a code word.
2 Open the **Install Options** parameter dialog, and click the **Add License String** number.
3 Place the cursor in the text field.
4 Type the code word on the on-screen keyboard.
5 Check that the 32 characters are entered correctly into the text field.
6 Click the **Apply License String** button.
7 Exit the parameter dialog, and restart the sonar.
8 Check that the option is available for use.

Software procedures

Backup and restore

Software backup is provided using dedicated software and storage devices.

A USB memory device is included with the sonar. This device is bootable, and it contains the following information:

Folder	Information
OS	Licensed Windows XP operating system backup file (*.gho)
Sonar	Sonar software
DOS7	DOS7 operating system files, used to create a bootable USB memory device
USB	HP USB utility, used to create a bootable USB memory device
Ghost	Norton Ghost 8 (DOS version), used to create backup, and to restore
Backup	Empty folder for client backup

The USB memory device included with the sonar is dedicated to the specific Processor Unit supplied. The operating system backup file on the USB device is licensed.

We strongly advice you to create your own backup once the sonar installation has been completed. Your backup will then include the operating system, the sonar software, as well as all the interface parameters defined.

• *How to create a backup image using the 'Norton Ghost 8' utility* on page 60

How to create a backup image using the 'Norton Ghost 8' utility

This procedure is used when you wish to create a backup containing your entire SH90 Processor Unit. The application used to do the backup is **Norton Ghost 8**. This application is provided on a bootable USB memory device.

To create the backup image, you need the bootable USB memory device provided with the SH90.

1 Boot the computer from the USB memory device.

This procedure describes how to start up SH90 Processor Unit from a bootable USB memory device, and how the **Norton Ghost 8** utility starts automatically.

1 Connect a computer keyboard to one of the USB connectors on the computer.

2 Insert the bootable memory device (USB memory stick).

3 Power up the Processor Unit with the front mounted on/off button (behind the lid).

4 As soon as the BIOS starts to load, press **F8** to choose boot device.

5 When the boot device selection dialog opens, choose the USB memory stick

It is normally identified as `USB: [name of memory stick]`

6 Allow the computer to boot.

7 Observe that the **Norton Ghost 8** utility starts automatically.

8 Click **Ok** in the **Norton Ghost 8** start-up dialog.

2 Click **Local →Disk →To image**.

3 Choose the local source drive. This is the disk partition to be copied to the backup disk.

Click **2** to select the largest partition. The small partition is the USB memory device.

4 Click **Ok**.

5 Choose which folder on the USB memory stick to hold the data.

If you use the factory USB memory device, folder **Backup** has been prepared for this use.

6 Enter preferred name for the image file.

7 Click **Save**.

8 In the next dialog, click **High** to use maximum file compression.

9 In the next dialog, click **Yes** to proceed with the image file creation.

10 Wait for the backup process to finish. Once completed, remove the USB memory stick, and restart the computer.

How to restore from a backup image using the 'Norton Ghost 8' utility

This procedure is used when you wish to restore the SH90 software from a pre-made backup file containing your entire installation. The backup file may either be generic, or it may be custom made to fit your system. The application used to restore from the backup is **Norton Ghost 8**.

If you restore your system from a generic image file, you must both change the Windows license, and activate it, before you can use the SH90. You must also reinstall the SH90 software.

1 Boot the computer from the USB memory device.

This procedure describes how to start up SH90 Processor Unit from a bootable USB memory device, and how the **Norton Ghost 8** utility starts automatically.

1. Connect a computer keyboard to one of the USB connectors on the computer.
2. Insert the bootable memory device (USB memory stick).
3. Power up the Processor Unit with the front mounted on/off button (behind the lid).
4. As soon as the BIOS starts to load, press **F8** to choose boot device.
5. When the boot device selection dialog opens, choose the USB memory stick

   It is normally identified as `USB: [name of memory stick]`
6. Allow the computer to boot.
7. Observe that the **Norton Ghost 8** utility starts automatically.
8. Click **Ok** in the **Norton Ghost 8** start-up dialog.

2. Click **Local →Disk →From image**.
3. Choose from which folder on the USB memory stick to restore the data.

   If you use the factory USB memory device, folder **Backup** has been prepared for this use.
4. Choose the backup file to restore.
5. Choose to which drive you wish to restore the data.

   Use **Drive 2**. This is the largest drive.
6. Click **Ok** to verify the drive details.
7. Click **Yes** to proceed with the restore.
8. Wait for the restore process to finish. This will take some time depending on the size of the data.
9. Click **Reset computer** when the restore has finished.
10. Allow Windows to boot.
11. Click **Yes** when the computer wishes to restart.
12. When the computer has restarted, proceed with normal operation.

How to reactivate the Windows licence

This procedure assumes that you have restored your Processor Unit from a generic operating system backup. Using this method, the Windows license on the Processor Unit is wrong, and it is not

activated. Since an inactivated license only will work for a short period of time, it is very important that it is activated. Windows provides a dedicated utility (wizard) to do this.

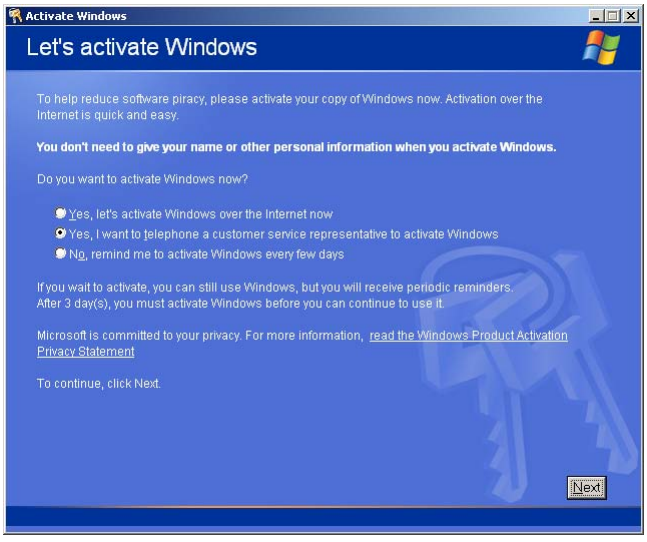
> You must activate Windows within 30 days of installation. Activation helps verify that Windows on your computer is genuine and that it hasn't been used on more computers than the Microsoft Software License Terms allow. In this way, activation helps prevent software counterfeiting. You can activate either online or by phone. To activate online, you'll need an Internet connection. Activating by phone requires interacting with an automated phone system.
>
> — *http://windows.microsoft.com*

Note

This procedure is only valid for Windows XP.

1. Connect a computer keyboard to one of the USB connectors on the computer.
2. Allow the computer to restart with the new operating system.
3. Answer **Yes** to reactivate Windows.

   If the system fails to ask, you can start the activation wizard by clicking **Run** in the bottom left corner, and choose **Activate Windows** from the menu.
4. Observe the following dialog:


Activate Windows
Let's activate Windows
To help reduce software piracy, please activate your copy of Windows now. Activation over the Internet is quick and easy.
You don't need to give your name or other personal information when you activate Windows.
Do you want to activate Windows now?
Yes, let's activate Windows over the Internet now
Yes, I want to telephone a customer service representative to activate Windows
No, remind me to activate Windows every few days
If you wait to activate, you can still use Windows, but you will receive periodic reminders. After 3 day(s), you must activate Windows before you can continue to use it.
Microsoft is committed to your privacy. For more information, read the Windows Product Activation Privacy Statement
To continue, click Next.
Next

5. Click **Yes, I want to telephone a customer service representative...**.
6. Click **Next**.
7. Observe the following dialog:

Activate Windows
Activate Windows by phone
Just four steps, and you're done...
Step 1:
Select your location
Step 2:
Call a number below to speak with a customer service representative:
Toll-free number:
Toll number:
Step 3:
Provide the customer service representative with the following installation ID:
181566-675500-279052-545715-207804-329611-188796-165982-949684
(Click Change product key only if requested to do so by the customer service representative)
Step 4:
Type the confirmation ID that the customer service representative gave you:
A B C D E F G
To continue, click Next.
Back
Change Product key
Remind Me Later
Next

8 Click **Change Product key**.

9 Observe the following dialog:

Activate Windows
Change product key
If you need to change your product key, please enter it in the fields provided below, and then click Update. If not, click Telephone to return to the previous activation page.
The 25-digit product key can be found on the Certificate of Authenticity (COA) label attached to your computer or Windows documentation. It should look similar to the following example.
New key:
Please contact your computer manufacturer if you are unable to locate you COA label.
Telephone
Remind Me Later
Update

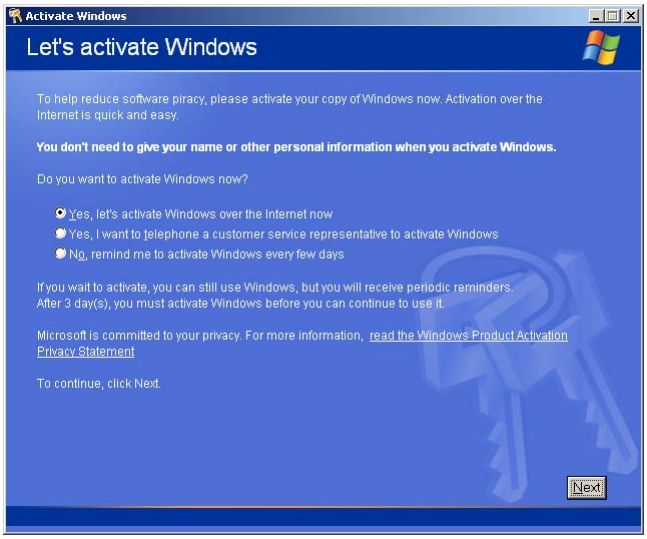
10 Enter the license code

The license is found on a sticker on the rear side of the lid covering the DVD player.

11 Click **Update**.

12 Click **Back**.

13 Observe the following dialog:


Activate Windows
Let's activate Windows
To help reduce software piracy, please activate your copy of Windows now. Activation over the Internet is quick and easy.
You don't need to give your name or other personal information when you activate Windows.
Do you want to activate Windows now?
Yes, let's activate Windows over the Internet now
Yes, I want to telephone a customer service representative to activate Windows
No, remind me to activate Windows every few days
If you wait to activate, you can still use Windows, but you will receive periodic reminders. After 3 day(s), you must activate Windows before you can continue to use it.
Microsoft is committed to your privacy. For more information, read the Windows Product Activation Privacy Statement
To continue, click Next.
Next

14 If your computer is connected to the Internet.

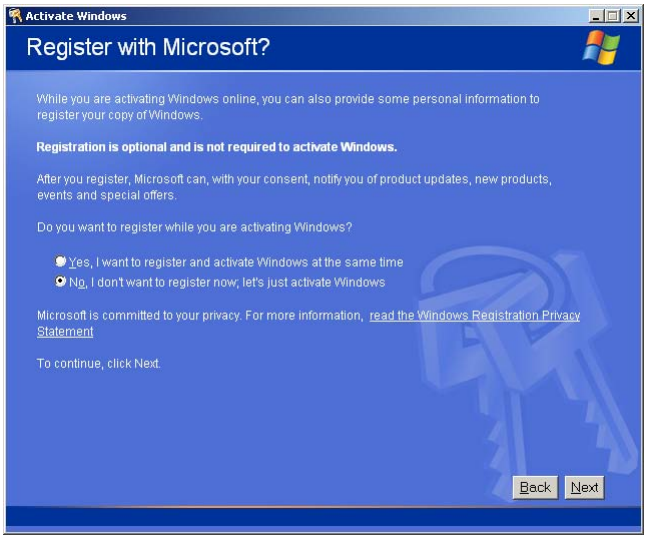
Note

Do not leave the computer connected to the Internet for longer than absolutely required. It is neither protected by anti virus applications nor firewall.

1 Click **Yes, let's activate Windows over the Internet now**.

2 Click **Next**.

3 Observe the following dialog:


Activate Windows
Register with Microsoft?
While you are activating Windows online, you can also provide some personal information to register your copy of Windows.
Registration is optional and is not required to activate Windows.
After you register, Microsoft can, with your consent, notify you of product updates, new products, events and special offers.
Do you want to register while you are activating Windows?
Yes, I want to register and activate Windows at the same time
No, I don't want to register now; let's just activate Windows
Microsoft is committed to your privacy. For more information, read the Windows Registration Privacy Statement
To continue, click Next.
Back
Next

4 Click **No, I don't want to register now...**.

5 Click **Next**.

6 Observe the following dialog:

15 If your computer is not connected to the Internet.

1 Click **Yes, I want to telephone a customer service representative...**.

2 Click **Next**.

3 Observe the following dialog:

Activate Windows
Activate Windows by phone
Just four steps, and you're done...
Step 1: Select your location
Step 2: Call a number below to speak with a customer service representative:
Toll-free number:
Toll number:
Step 3: Provide the customer service representative with the following installation ID:
181566-675500-279052-545715-207804-329611-188796-165982-949684
(Click Change product key only if requested to do so by the customer service representative)
Step 4: Type the confirmation ID that the customer service representative gave you:
A B C D E F G
To continue, click Next.
Back
Change Product key
Remind Me Later
Next

4 Select your location.

5 Call the number provided.

6 Provide the installation ID to the service desk.

7 Type in the confirmation ID provided to you.

8 Click **Next**.

9 Observe the following dialog:

16 When activation succeeds, click **OK**, and allow the computer to restart.

DISPLAY MODES

This chapter describes the Simrad SH90 display modes. The various modes represent the graphical presentation of sonar data. Several display modes are available to present the best possible presentations as well as flexible choices for a large range of user applications.

Note

*The descriptive order of the display modes in this chapter has been chosen only to simplify the descriptions. In operational conditions, the order depends on the selected gear. This is because different initial display modes are used for easy selection by the four **Mode** buttons on the Operating Panel. The order of these display modes can easily be changed in the **Sort Mode** menu.*

Topics

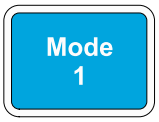
- *How to choose display mode* on page 68
- *Bow up* on page 70
- *Bow up/Audio* on page 71
- *Bow up/Vertical* on page 72
- *Bow up/Dual Vertical* on page 73
- *Bow up/180° Vertical* on page 74
- *True motion* on page 75
- *True motion/Vertical* on page 76
- *North up* on page 77
- *Dual 1* on page 78
- *Dual 2* on page 79
- *270°/Vertical* on page 80

How to choose display mode

Display mode selection is made by clicking the **Mode** button on the top of all menus. The four first display modes shown can also easily be selected with the four **Mode** buttons on the Operating Panel.

1 Locate the **Mode** field on your Operating Panel

2 Press one of the four buttons to choose mode.



Alternative method

1 Locate the **Mode** button on the top of each menu.

2 Click the **Mode** button to choose operational mode.

Click the left or right side of the **Mode** button to choose mode, or the middle of the button to open the parameter dialog.

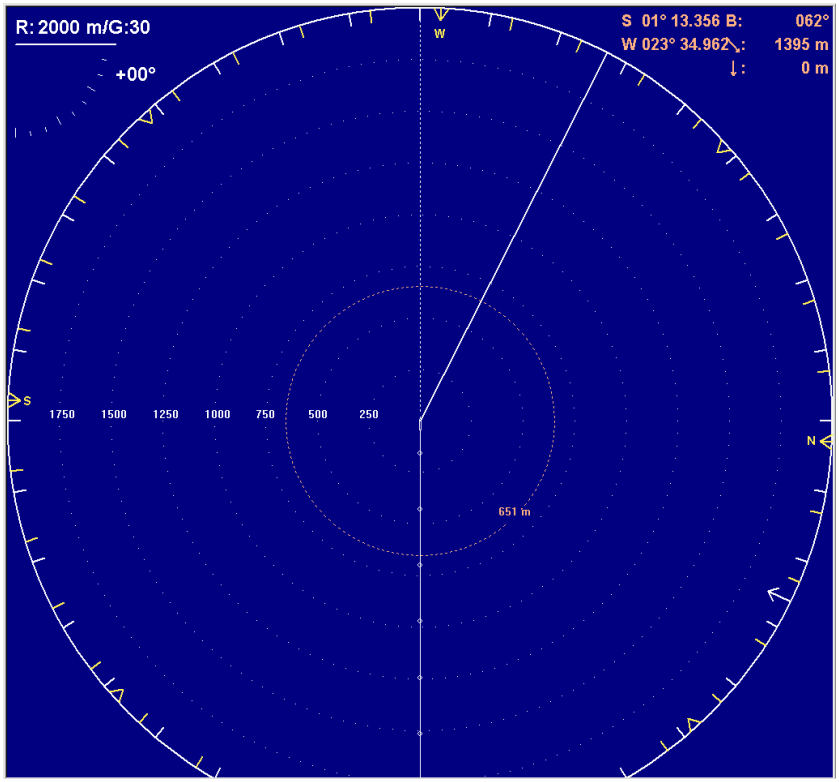
Related topics

- *Mode procedures* on page 43
- *Sort Modes menu* on page 107
- *Mode Buttons* on page 145

Bow up

When *Bow up* mode is selected, the vessel symbol is stationary on the screen with the bow pointing upwards. The echo presentation covers 360 degrees around the vessel, and all echoes are updated for every ping. The distance from the vessel symbol to the outer echo ring is equal to the selected range. The movement of the echoes across the screen are controlled by a combination of the vessel's course and speed and the target's own movements.

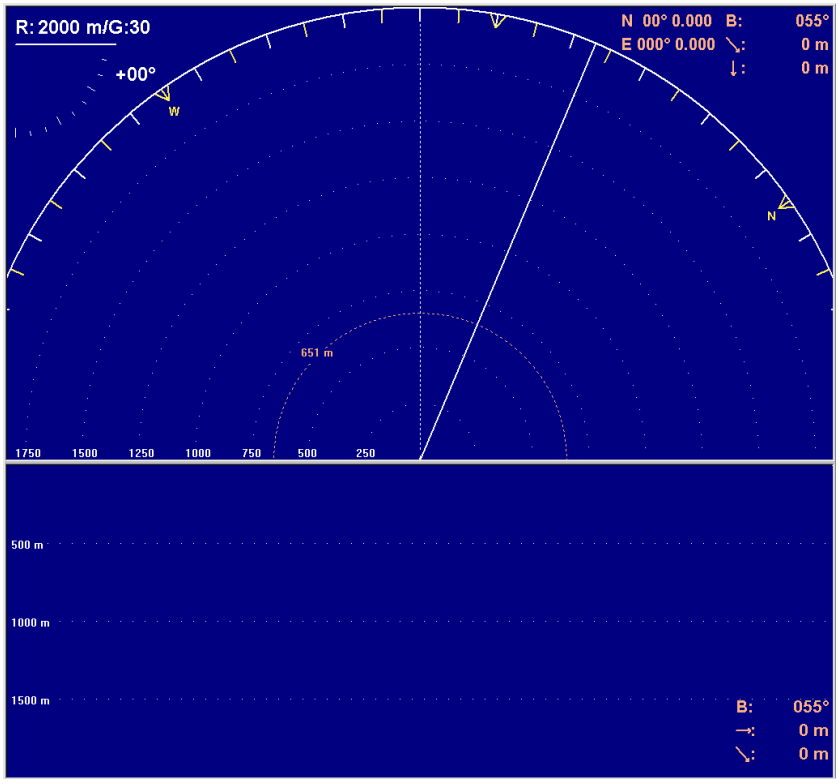
Figure 20 'Bow up' display mode



Bow up/Audio

When *Bow up/Audio* mode is selected, the upper half of the screen shows a bow-up presentation, while the lower part is used for a recording of the audio channel. The audio channel is shown with a continuous white line in the horizontal picture, and it can be trained in any direction. The recorded echoes are a direct replica of the echoes under the white audio line. As the audio channel is recorded over a period of time, this mode is especially useful for detection of weak echoes mixed with reverberation or noise. The information recorded by the audio channel is always stored in the computer, even if another mode is selected. That means that this recording will always be presented when selecting the *Bow up/Audio* mode. Note that the vessel symbol can be moved to any position in the horizontal view with the cursor and **Off Centre** button on the Operating Panel.

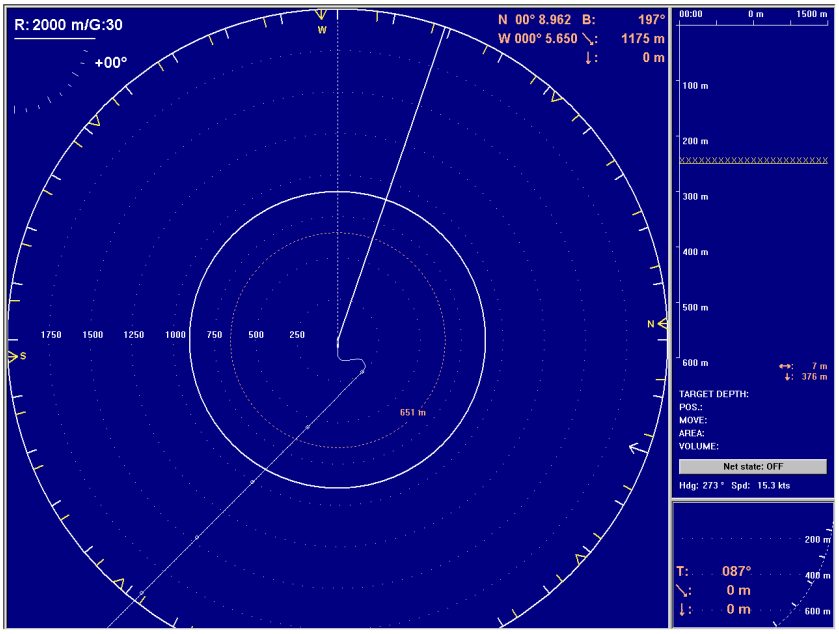
Figure 21 'Bow up/Audio' display mode



Bow up/Vertical

When *Bow up/Vertical* mode is selected, the picture is divided into three sections; where the left side is a bow-up presentation similar to the *Bow up* presentation previously described. The upper part on the right hand side is a *Catch data* presentation, while the lower part is a *Vertical slice* presentation.

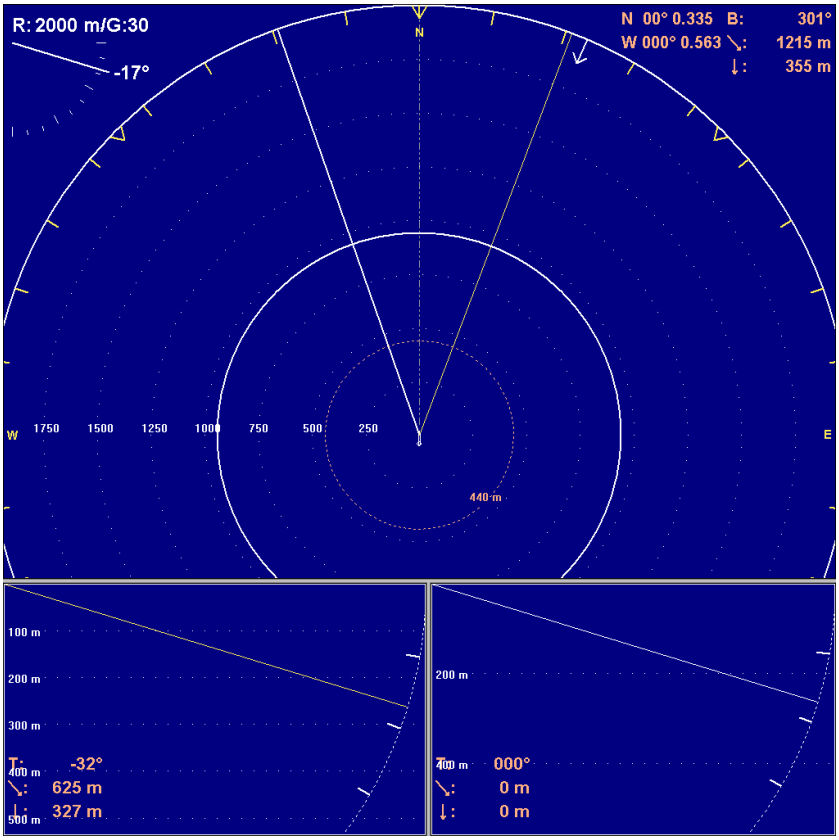
Figure 22 'Bow up/Vertical' display mode



Bow up/Dual Vertical

When *Bow up/Dual vertical* mode is selected, the upper part of the screen shows a curtailed bow-up presentation, while the lower part shows two vertical slice presentations. The bearing of the left vertical presentation is indicated by the white audio line in the horizontal presentation, while the bearing of the right vertical presentation is indicated by the yellow-dashed line. All borders between the different views may be moved to any position by using the trackball.

Figure 23 'Bow up/Dual vertical' display mode

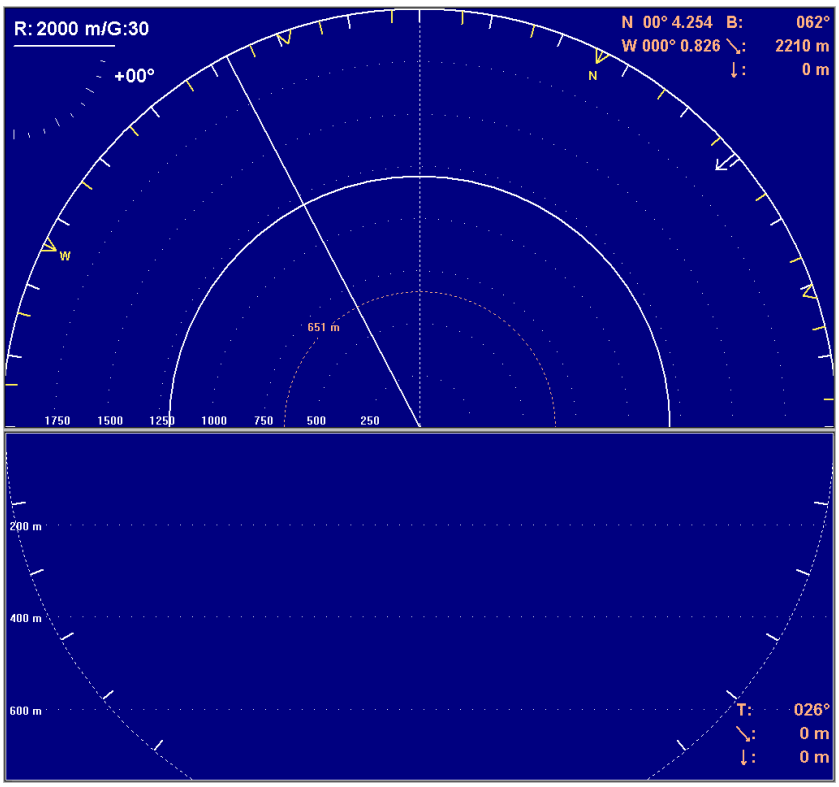


This mode is mainly intended for purse seining, where the audio line (*Vertical 1*) can track the target, while in the *Vertical 2* slice can be used to search manually around a tracked target. The *Catch data* presentation can be selected in the menu field. In this presentation, the gear position is shown in relation to a synthetic presentation of a tracked school. In addition, all available target data are shown.

Bow up/180° Vertical

When the *Bow up/180° Vertical* mode is selected, the upper part of the screen shows a curtailed *Bow up* presentation, while the lower part shows a 180 degrees *Vertical slice* presentation. This mode is mainly intended for trawlers, where the vertical view acts as a multibeam echo sounder. The bearing of the vertical slice can be selected in the **Vertical View** menu. You can control the audio line, an indicator line, or you can set it to be locked in forward, aft or athwart ships position. As the cylindrical transducer has a “blind zone” straight down, an echo presentation in this direction will be limited to two approximately 60 degrees sectors. To avoid this “blind zone”, the vertical slice is made “tippable”, and by selecting a -60 degrees tip angle (or less), a full 180 degrees coverage is obtained. The tip angle can be adjusted from +10 to -90 degrees. In addition to the read-out in the **Tip** menu button, the selected tip angle is shown with a dotted yellow line in the tilt indicator in the upper left corner.

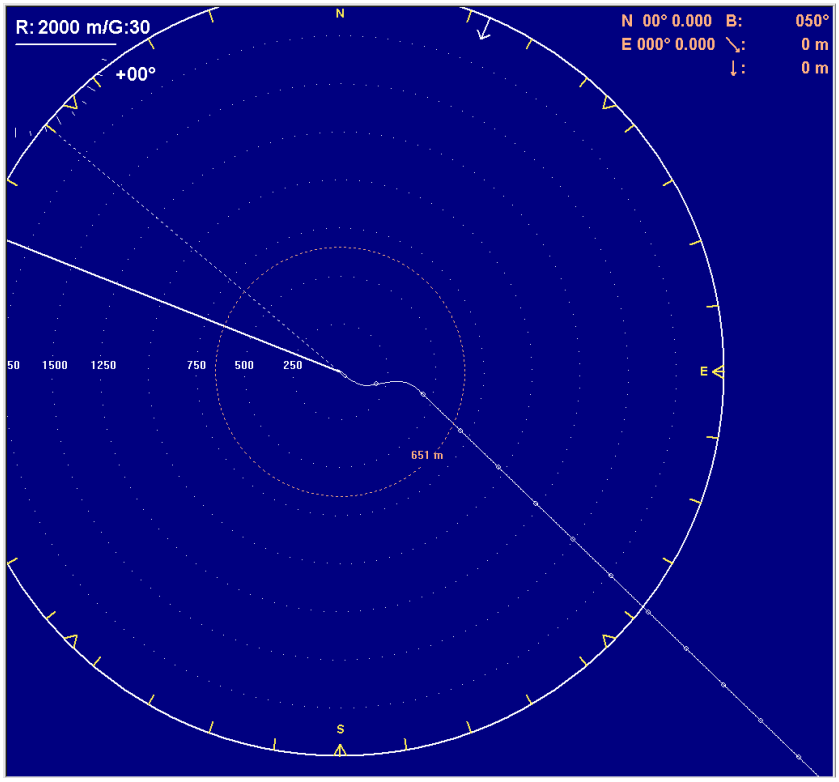
Figure 24 ’Bow up/180° vertical’ display mode



True motion

When *True motion* mode is selected, the picture is locked to a geographical position, where the vessel moves around the screen according to its present course and speed. All echoes are always presented in their correct position relative to the vessel, and their movements on the screen will be a true representation of the movements of the targets through the water. When the vessel symbol reaches the edge of the screen, it will automatically be moved back to the centre, or to a position determined by the **Off Centre** button on the Operating Panel. This position is reset to the screen centre whenever the mode is changed. When you press the **Target Track** button, the target will automatically be moved to the screen centre.

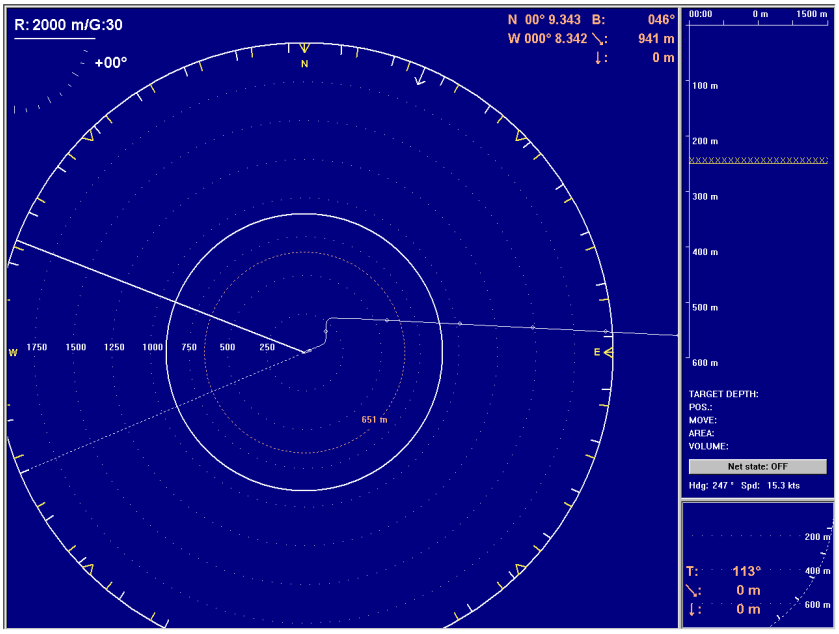
Figure 25 'True motion' display mode



True motion/Vertical

When *True motion/Vertical* mode is selected, the picture is divided into three sections; where the left side is a *True motion* presentation similar to the true motion presentation previously described. The upper part on the right hand side is a *Catch data* presentation, while the lower part is a *Vertical slice* presentation.

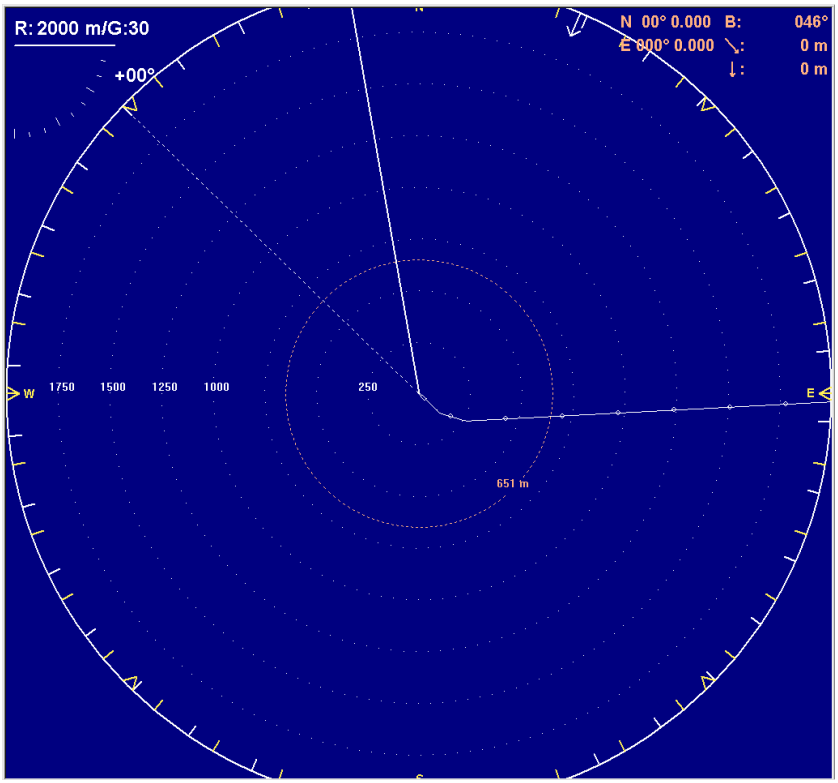
Figure 26 'True motion/Vertical' display mode



North up

When *North up* mode is selected, true north is always up on the screen. The vessel symbol is stationary with the bow pointing in the vessel's course direction. The movement of the echoes across the screen are controlled by a combination of the vessel's course and speed and the target's own movements.

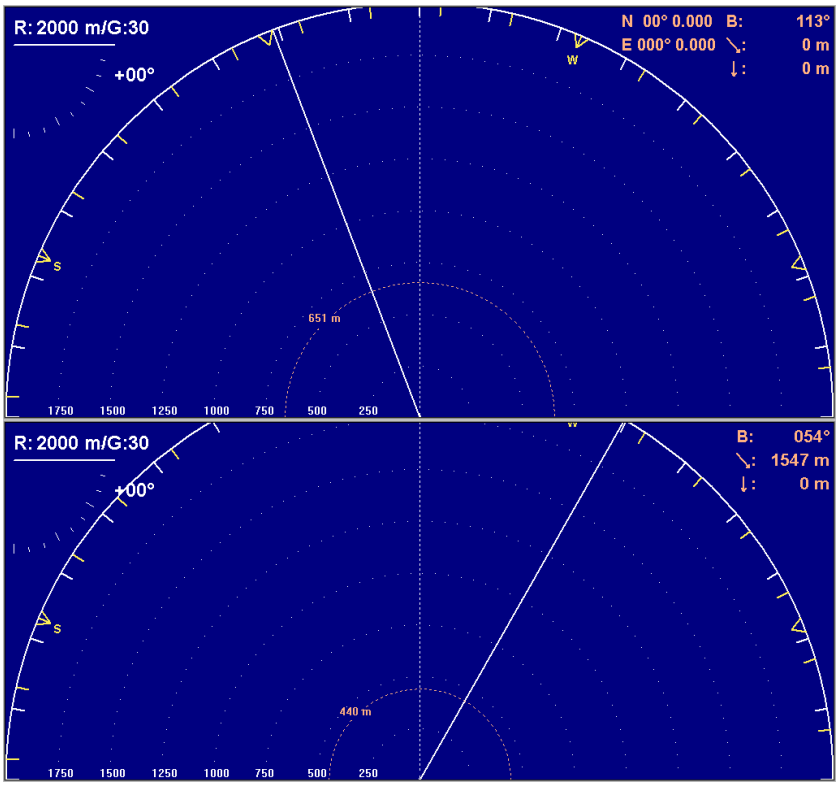
Figure 27 'North up' display mode



Dual 1

The *Dual 1* mode is a kind of "two sonars in one" operation, where each presentation is updated for every second transmission. All settings can be set individually for each of the two presentations. This makes the dual mode especially useful for optimizing settings by directly comparing the two presentations. To optimize the horizontal settings, use the **Horizontal** menu to try different settings in the upper picture. These settings are automatically transferred to the other modes. The dual operation may also be used for other user applications, where different range, tilt, frequency and other parameters can be selected.

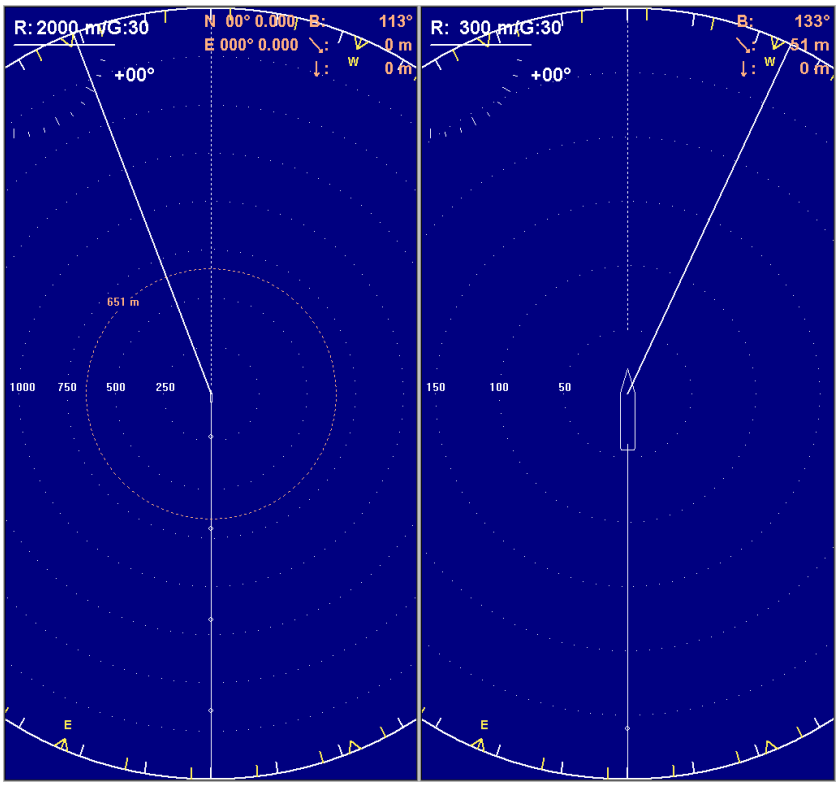
Figure 28 'Dual 1' display mode



Dual 2

The *Dual 2* mode is very similar to the *Dual 1* mode previously described, but the “two sonars” are presented next to each other. All settings can still be set individually for each of the two presentations.

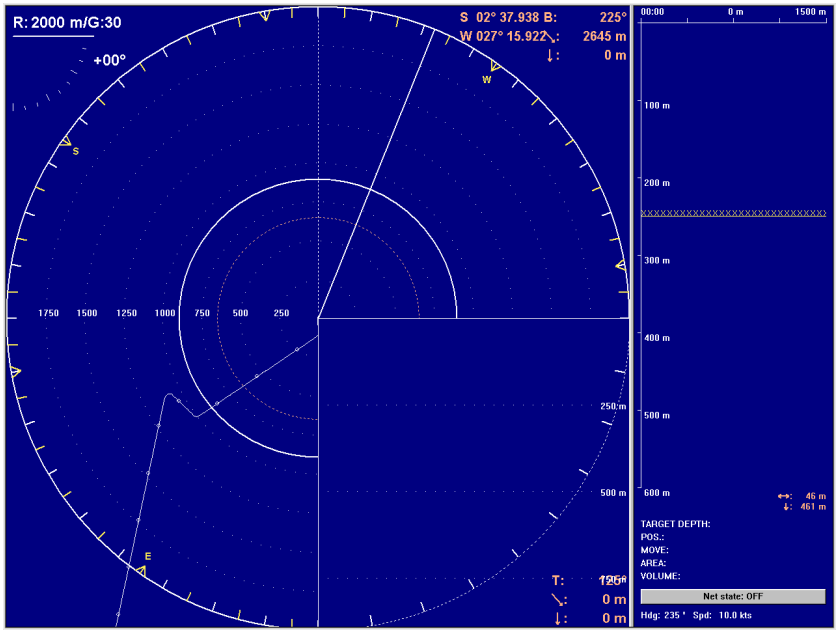
Figure 29 ’Dual 2’ display mode



270°/Vertical

The *270°/Vertical* mode is specially designed for purse seining. The vertical half slice is displayed in the lower left corner for normal setting with the net on the starboard side. If the net is set on the port side, the 60 degrees vertical slice will be displayed in the lower right hand corner. With this presentation, it is easy to keep the best contact with a school in both the vertical and horizontal presentation, and to determine its size distribution. The position of the school relative to the bottom is another important information provided by this presentation. The *Catch data* presentation for purse seining is shown on the right hand side. It shows all the net data relative to the target and the bottom, as well as all available target data.

Figure 30 '270°/Vertical' display mode



OPERATING PANEL

This chapter describes the Simrad SH90 Operating Panel.

The frequently used functions are directly accessible by the designated control buttons on the Operating Panel, and may enter operational commands directly. The buttons are grouped in fields according to their purpose. Most sonar functions are also accessible and activated using the menu system on the display and the trackball and **Select** button on the Operating Panel.

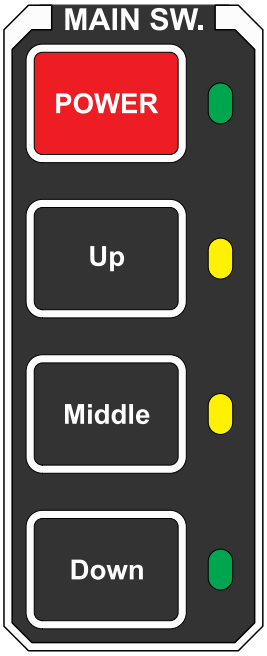
Figure 31 Operating Panel

Topics

- *'Main switch' field* on page 82
- *'Symbol' field* on page 83
- *'Mode' field* on page 85
- *'Gain' field* on page 85
- *'Range' field* on page 86
- *'Cursor' field* on page 86
- *'Train' field* on page 88
- *'Tilt' field* on page 89
- *'Various' field* on page 91

'Main switch' field

The **Main switch** buttons controls the power on/off sequence and the hoisting and lowering of the transducer. It also indicates the transducer's current position.



Power

This is the sonar's "on/off" switch.

- Pushing **Power** for approximately two seconds powers up the sonar. The adjacent green LED blinks while the Processor Unit boots up, and remains illuminated once the system is operational.
- Before the sonar can be powered down, the transducer must be in the upper position. Pushing the **Power** button for approximately two seconds secures power to the unit which is confirmed by the adjacent green LED being extinguished.

Up

This button raises the transducer to its upper position. The adjacent green LED blinks while the transducer is raised and remains illuminated once it is housed safely inside the hull of the vessel. The green blinking LED will also be accompanied by an audible signal.

Middle

The **Middle** button raises or lowers the transducer to its middle position. The physical location of the middle position can be defined in the **Transducer** parameter dialog.

Down

The **Down** button lowers the transducer to its lower position. The adjacent green LED blinks while the transducer is lowered and remains illuminated when lower position is reached. The green blinking LED will also be accompanied by an audible signal.

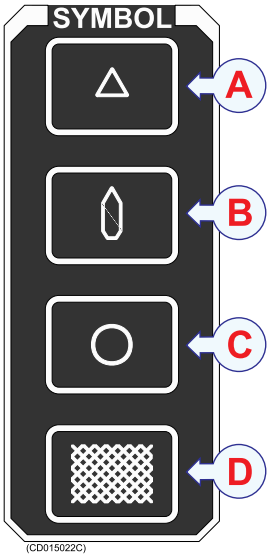
'Symbol' field

The **Symbol** buttons provide on-screen graphic references for targets, own ship and fishing gear.

(A) Target marker

To mark a target, move the cursor over it and press the button. A triangular symbol with a corresponding number will appear on the screen over the target. Position data for the defined markers are displayed in the **Objects** menu.

- Note that the system continues to track the markers even when outside the sonar range.
- The **Target marker** button can also be used for manual target tracking as the system is designed to calculate the speed, course and distance between the last two chosen targets.
- The target marker data is displayed in white figures for 15 minutes in the lower right hand corner of the horizontal presentation. This function is also an effective method for determining the distance between two selected points on the screen.



(B) Own ship symbol

The "own ship" button produces a square symbol on the screen at the vessel's current location when the button is pressed. The own ship marker's position data is displayed in the **Objects** menu.

(C) Circle marker

This marker may be used to estimate the size of a school of fish or as an indication of the size of the purse seine. To activate the function, move the cursor to the desired position and press the button. A circular symbol will appear on the screen at the chosen location. The size of the symbol is equal to that of the purse seine selected.

(D) Gear symbol

The gear symbol may be either a purse seine circle or a trawl symbol depending on the parameter chosen by the **Gear** button in the **Setup** menu. The selected gear symbol will be displayed in yellow.

Seine circle

This is a useful aid in planning the shooting of the purse seine.

1 Press the **Gear** button.

- The purse seine circle will appear on the forward end of the ship symbol on the corresponding side of the vessel selected in the **Setup** menu. The circle will follow the vessel's movements.

2 At the moment the seine is shot, press the **Gear** button again.

- The purse seine circle will remain stationary and indicate the ideal path for setting the seine. Three square symbols on the ship's course line indicate the: shooting, one half, and the end of the seine positions. Three different nets can be defined in the **Gear** menu.

3 Press the **Gear** button to delete the Purse Seine circle.

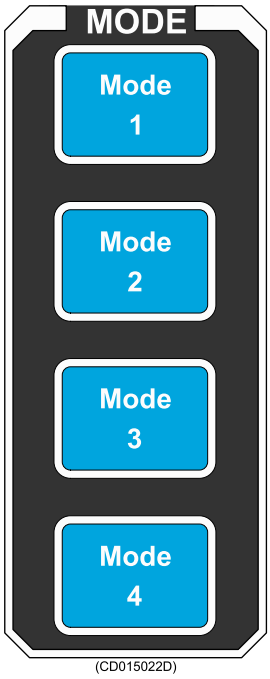
Trawl symbol

This is a useful aid in providing an overview of the trawl operation. Trawl data can be set manually using the menu or automatically by interfacing a Simrad FS trawl sonar or Simrad ITI trawl monitoring system with the sonar.

- In the manual mode the trawl symbol will be displayed with the selected size, depth and distance.
- When the FS70, FS900 or FS3000 trawl sonar is connected, the trawl symbol will automatically be displayed with the correct depth in the vertical modes.
- When the ITI trawl system is connected, the trawl symbol will be displayed with the correct distance, bearing and depth. If required, the trawl opening, ambient water temperature, and trawl-filling indicator may also be displayed.

'Mode' field

The four **Mode** buttons can be used to select either the four favourite display modes or user settings. The set up the buttons to choose modes or settings, select **Mode Buttons** in the **Display** menu.



Depending on the selection you make in the **Mode Buttons** parameter dialog, you have two options: you can select a mode or a user setting.

Select mode

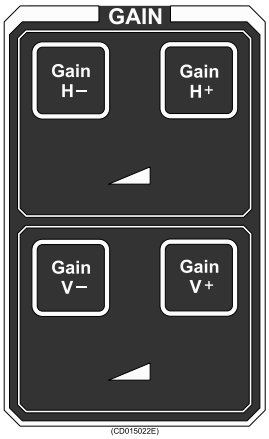
To select a mode, click the **Mode** button on the top of the display menu, or press one of the four **Mode** buttons. Frequently used operational modes that are task specific to particular phases of the fishing operation can be defined in the **Sort modes** menu. For example, **Mode 1** may be used for the search phase, **Mode 2** for the evaluation phase, **Mode 3** for the catch phase, and **Mode 4** for dual operation.

Select user

To select a user setting, you click **User Settings** on the **Setup** menu, or use one of the four **Mode** buttons on the Operating Panel. The different user settings are created and maintained in the **User Setting** parameter dialog. To choose user setting assignment to the four buttons, sort the list of users alphabetically.

'Gain' field

Gain controls are specified as either horizontal or vertical.



Horizontal gain

The two upper **Gain** buttons control receiver gain effecting the horizontal presentation of the sonar. The level of gain selected is display in the Horizontal menu and on top of the tilt indicator in the upper left-hand side of the display. You can select from 51 values numbered from 0 to 50, and these may be changed in steps of 1 dB.

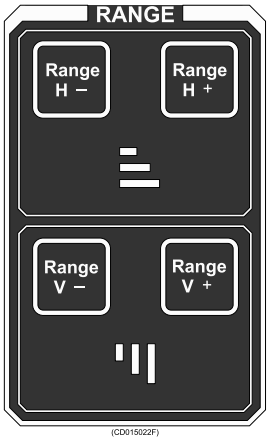
Vertical gain

The two lower **Gain** buttons control receiver gain effecting the vertical presentation of the sonar. The level of gain selected

is display in the **Vertical** menu. You can select from 51 values numbered from 0 to 50, and these may be changed in steps of 1 dB.

'Range' field

Range controls are specified as either horizontal or vertical.



Horizontal range

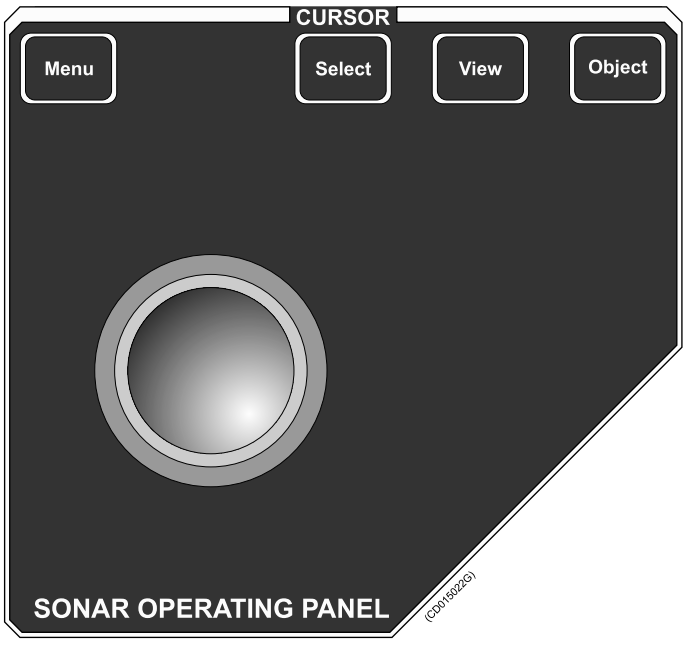
The two upper **Range** buttons control the horizontal range. The range selected is displayed in the **Horizontal** menu, and on top of the tilt indicator in the upper left corner of the display.

Vertical range

The two lower **Range** buttons control the vertical range. The range selected is displayed in the **Vertical** menu.

'Cursor' field

The **Cursor** field is used for on-screen cursor orientation and menu operation.



Menu

The **Menu** button is used for selection between *Menu* and *Full Screen* presentations. When the main menu is displayed, the echo presentation will be reduced correspondingly. In *Full Screen* presentation, the full dimension of the screen is used for the echo presentation. When the full screen echo presentation is displayed, the cursor may be used to activate the menu field by moving it to the left or right extremes of the screen. If you move the cursor outside the menu field it will hide the menu.

Select

The **Select** button is used to execute a selection. This corresponds to the left button on a standard computer mouse.

View

The **View** button activates the **View** pop-up menu for the selected display window. This button corresponds to the middle button on a standard computer mouse.

Object

The **Object** button activates the **Object** pop-up menu for the selected display window. This button corresponds to the right button on a standard computer mouse.

Trackball

The trackball controls the cursor, and allows you to move the cursor on the sonar display. The cursor changes appearance in relation to its location on the screen.

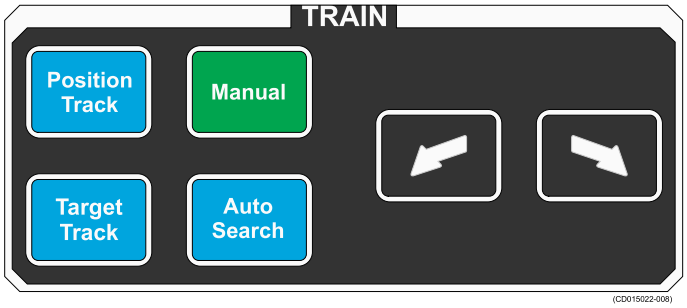
- An *Orange* cursor in the echo field.
- An *Arrow* in the menu field.
- A *Negative* or *Positive* sign at each end of the menu buttons.

  The negative or positive sign indicates the direction in which the corresponding parameter values will be changed when the **Select** button is pressed.
- A *Menu* symbol in the centre of the button.

  When this symbol is shown, the relevant parameter dialog is opened when you press the **Select** button.

'Train' field

The audio channel is displayed as a continuous white line. It can be trained either manually or automatically. The bearing angle is displayed in the upper right-hand corner of the display, indicated relative to the bow.



Manual

In the *Manual* mode the **Train left** and **Train right** (arrow) buttons are used to direct the audio line to the desired bearing.

Auto search

In the *Auto search* mode the sonar will automatically search within previously defined sector limits with the selected audio line designating the centre of the search. The search sector is displayed on the bearing card with two white angular symbols.

- The search sector is adjusted by pressing and holding the **Auto Search** button and simultaneously pressing the **Train left** or **Train right** (arrow) buttons.
- The *Auto search* function is overridden when either the **Train left** or **Train right** (arrow) buttons are pressed and will continue once the button is released. The present bearing at the moment either button is released will become the centre of the search.

Position track

The *Position track* function is only available when both a course gyro and a speed log are interfaced to the sonar system. To track a fixed position, place the cursor over the desired location and press the **Position Track** button. A geographically fixed circle will appear on the display, and its position will automatically be tracked by the system with respect to the bearing and tilt angle. When the *Auto tilt* function is activated in the *Position track* mode the tilt search centre is automatically adjusted with regard to the distance to the tracked position.

Target track

To track a target, place the cursor over the desired location and press the **Target Track** button. A circle will appear on the display and its position automatically tracked by the system using the strongest echo centred in the ”window” represented by two lines on the audio line. The “window’s” size may be selected by the **Track Window** button in the **Setup** menu.

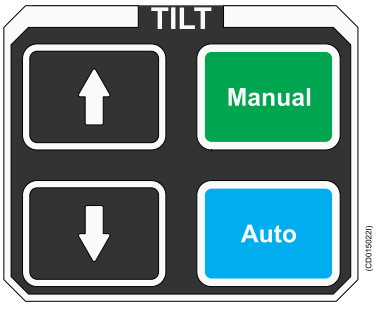
- The vector originating from the target’s centre indicates its course and speed. The length of the vector increases relative to the target’s speed. One knot is represented by a small mark on the vector. A course line can also be displayed showing the target’s track.
- Target tracking symbols and data are displayed with a light violet colour. In addition to the information on the *Catch data* page, the speed, course and distance for some modes are found in the lower left hand corner of the screen.
- In *Manual tilt* mode, the tilt angle will automatically be adjusted with respect to the distance to the tracked target.
- When the *Auto tilt* function is activated in the *Target track* mode, the tilt search centre is automatically adjusted with regard to the distance to the tracked position.

Note

Manual training overrides the Target Tracking function.

’Tilt’ field

The **Tilt** buttons allows you to control the vertical angle of the transducer beam, and provide a program for an automatic tilt sequence.



Manual tilt

In *Manual* mode the transducer may be tilted within the systems limits by pressing the **Tilt up** and **Tilt down** (arrow) buttons. Pressing either button once changes the tilt angle in steps of 1 degree. Pressing and holding either button continuously changes

the tilt angle until pressure is removed. In the *Position* and *Target Tracking* modes, the tilt angle will automatically be adjusted to compensate for the distance to the tracked position.

Auto tilt

In the *Auto tilt* mode the selected tilt angle forms the centre of the tilt search. The selected tilt limits are displayed on the tilt indicator by yellow lines and corresponding numerical values for both the upper and lower limits. The centre of the tilt search sector is adjusted by pressing the **Tilt up** or **Tilt down** (arrow) buttons. Sector limits are adjusted by pressing and holding the **Auto** button and simultaneously pressing the **Tilt up** or **Tilt down** (arrow) buttons. Tilt search sector limits can be increased in steps of 1 degree to 10 degrees according to the value selected in the in the **Tilt** parameter dialog. The *Auto tilt* function responds differently with regard to the training mode selected.

- *Manual training* mode: The transducer automatically changes the tilt angle after each transmission in steps within the selected limits.
- *Auto search training* mode: The transducer automatically changes the tilt angle after each complete search is performed.
- *Position* and *Target Tracking* modes: The tilt angle's search centre will automatically be adjusted with regard to the distance to the position being tracked. The transducer will tilt automatically in steps after each transmission.

Note

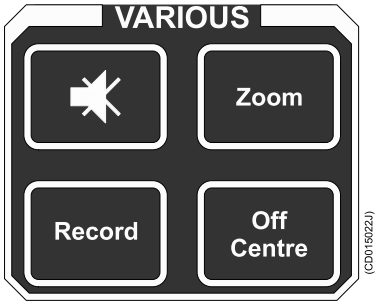
If the stabilisation system is activated, the beamformer will automatically adjust the tilt angle with regard to the vessel's motion (even if manual tilt is selected). The change in the tilt angle for the beamformer will not be shown on the tilt indicator.

Related topics

- *Tilt* on page 166

'Various' field

The buttons grouped under various are **Zoom**, **Record**, **Mute** and **Off Centre**.



Mute

The **Mute** button is used to acknowledge audible alarms, such as the **Fish Alarm**, and to acknowledge messages from the message system.

Record

The record function is used for storing either a sequence or single display picture. Sequential or single storage options are preset in the **Store/Recall** menu (available from the **Setup** menu). If sequential store mode is selected, the **Record** button is used to start and stop the recording. If single shot storage is selected, a new picture is stored each time the button is pressed. In order to recall stored images, you need to access the **Store/Recall** menu, and click the **Recall** button.

Zoom

The *Zoom* function magnifies an area of the display by positioning the cursor in its centre and pressing the **Zoom** button. Within the sonar presentation area, the **Zoom** button works as a toggle switch for on/off of the zoom function. In the text area of the screen (the four corners), the **Zoom** button works in steps.

Off centre

The *Off centre* function moves the **Own vessel** symbol to the cursor's position on the display. This adjusts the presentation to fill the screen accordingly.

Related topics

- *Display menu* on page 98
- *Store/Recall menu* on page 104
- *Store Mode* on page 164
- *Recall Mode* on page 154

MENU DESCRIPTIONS

This section provides a detailed description of the complete menu system for the Simrad SH90 Sonar system. The chapter *Menu structure* gives a description of the menu system configuration with references to more detailed descriptions of all the menu. Any selections you do in the menus will bring up the parameters available for the chosen setting. The *Alphabetical list of parameters* is a useful aid to find a description of a particular parameter of all available parameters incorporated in the Simrad SH90 sonar system.

Topics

- *About the menus* on page 92
- *Active menus* on page 93
- *Temporary menus* on page 102
- *Pop-up menus* on page 107
- *View menus* on page 111
- *Messages* on page 114

Related topics

- *Alphabetical list of parameters* on page 121

About the menus

The Simrad SH90 Sonar comprises a large number of different menus on several levels. Menus are selected by pressing their respective tabs on the right hand side, and the appearance of menus and tabs depends on the chosen operational mode and the current settings.

Menu types

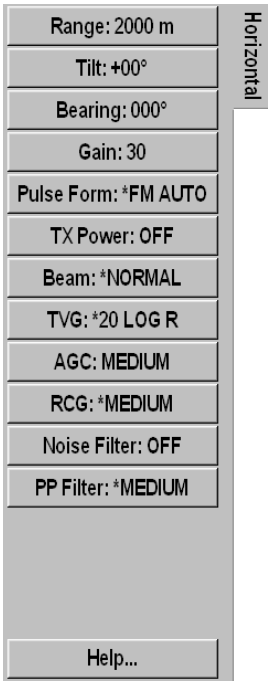
- **Active menus**: Relevant for each of the display modes, available at all times, can be selected by the appropriate tab.
- **Temporary menus**: Second level menus activated by a button in one of the active menus.
- **Pop-up menus**: Activated by the **View** and **Object** buttons on the Operating Panel, or the middle and right mouse button (provided that a computer mouse is installed).
- **View menus**: Activated in the **View** pop-up menu.
- **Messages**: Present system messages.

Active menus

The active menus are those relevant for the different operational modes. The menus are shown with vertical selector tabs on the right hand side, and each menu can easily be selected using the trackball and the **Select** button on the Operating Panel. All menus have access to on-line help through a **Help** button.

Horizontal menu

Menu description



The **Horizontal** menu is used to control the horizontal presentations. The parameters chosen are present in all display modes. When a horizontal parameter setting is selected and defined in one mode, the chosen settings will automatically be applied to all modes. The **Horizontal 2** menu is identical to the **Horizontal** menu. It is used during *Dual 1* and *Dual 2* operations.

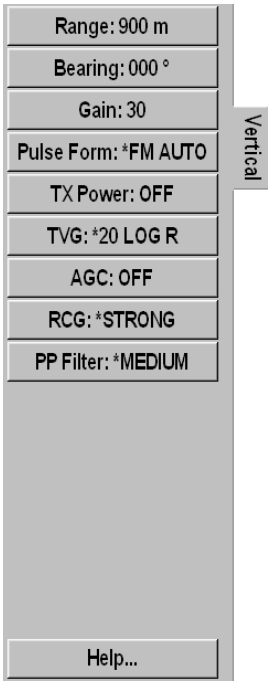
Menu buttons

- **Range**: Select the range for the horizontal presentation. (► *Range* on page 151)
- **Tilt**: Select the sonar beam's vertical angle. (► *Tilt* on page 166)
- **Bearing**: This button controls the direction of the white bearing line on your sonar picture. This line may be used to control the direction of the vertical slice. (► *Bearing (Horizontal)* on page 125)
- **Gain**: This setting controls the amplification of the received echoes in the horizontal presentation. If you activate the **AGC** (Automatic Gain Control) function, this gain setting is influenced. (► *Gain* on page 138)

- **Pulse Form**: Use this function to select the form of the transmitted pulse. This could either be FM (Frequency modulation) with different pulse lengths, or CW with different pulse lengths. (► *Pulse Form* on page 149)
- **TX Power**: This button controls the transmission power. (► *TX Power* on page 173)
- **Beam**: This button allows you to choose vertical beamwidth in the horizontal presentation. (► *Beam* on page 123)
- **TVG**: Time Varied Gain. This function will automatically adjust the gain in the sonar to compensate for geometric spread and absorption. Note that the TVG will only work within the first 1000 meters. (► *TVG* on page 172)
- **AGC**: Automatic Gain Control. This function will automatically reduce the gain if you experience reverberation and noise, or increase it if the conditions permit it. Using the AGC will ensure best possible signal processing. (► *AGC* on page 122)
- **RCG**: Reverberation Controlled Gain. This function will automatically remove unwanted reverberation from the bottom or from the sea surface. It may however also remove scattered fish. (► *RCG* on page 153)
- **Noise Filter**: This filter can be used to minimize the interference from other acoustic systems (sonars and echo sounders) on your own and other vessels. It will also suppress noise from your propellers, and from other similar noise sources. (► *Noise Filter* on page 146)
- **PP Filter**: The Ping-to-Ping filter will only show you the echoes if they are still present after several consecutive pings (2, 4 or 8). This function will provide you with a more stable echo presentation, as spurious echoes will be suppressed. (► *PP Filter* on page 148)

Vertical menu

Menu description



The **Vertical** menu is only shown in modes with a vertical slice function. All relevant settings, except the **TX Power**, can be selected separately for the vertical modes independent of the horizontal settings. When any vertical setting is selected and defined in one mode, the setting will be applied to all vertical modes.

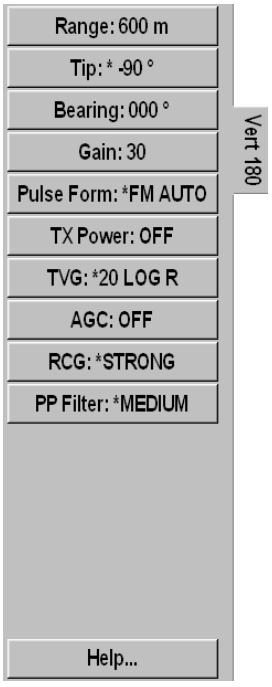
Menu buttons

- **Range**: Select the range for the vertical presentation. (► *Range* on page 151)
- **Bearing**: Use this function to adjust the bearing. (► *Bearing (Vertical)* on page 126)
- **Gain**: This setting controls the amplification of the received echoes in the vertical presentation. If you activate the **AGC** (Automatic Gain Control) function, this gain setting is influenced. (► *Gain* on page 138)
- **Pulse Form**: Use this function to select the form of the transmitted pulse. This could either be FM (Frequency modulation) with different pulse lengths, or CW with different pulse lengths. (► *Pulse Form* on page 149)
- **TX Power**: This button controls the transmission power. (► *TX Power* on page 173)
- **TVG**: Time Varied Gain. This function will automatically adjust the gain in the sonar to compensate for geometric spread and absorption. Note that the TVG will only work within the first 1000 meters. (► *TVG* on page 172)

- **AGC**: Automatic Gain Control. This function will automatically reduce the gain if you experience reverberation and noise, or increase it if the conditions permit it. Using the AGC will ensure best possible signal processing. (► *AGC* on page 122)
- **RCG**: Reverberation Controlled Gain. This function will automatically remove unwanted reverberation from the bottom or from the sea surface. It may however also remove scattered fish. (► *RCG* on page 153)
- **PP Filter**: The Ping-to-Ping filter will only show you the echoes if they are still present after several consecutive pings (2, 4 or 8). This function will provide you with a more stable echo presentation, as spurious echoes will be suppressed. (► *PP Filter* on page 148)

Vertical 180 menu

Menu description



The **Vertical 180** menu is only shown when the *Bow up/180° Vertical* mode is chosen. All relevant settings, except the **TX Power**, can be selected separately for the vertical modes independent of the horizontal settings. When any vertical setting is selected and defined in one mode, the setting will be applied to all vertical modes. The **Tip** button is only available on this menu. The **Tip** button is used to tip the vertical slice to avoid the blind zone.

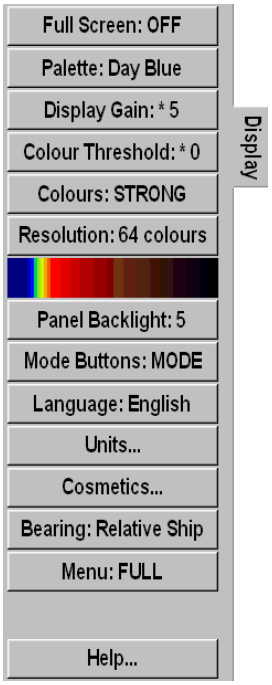
Menu buttons

- **Range**: Select the range for the vertical presentation. (► *Range* on page 151)
- **Tip**: Use this setting to tip the vertical slice to avoid the blind zone. (► *Tip* on page 167)
- **Bearing**: Use this function to adjust the bearing. (► *Bearing (Vertical)* on page 126)

- **Gain**: This setting controls the amplification of the received echoes in the vertical presentation. If you activate the **AGC** (Automatic Gain Control) function, this gain setting is influenced. (► *Gain* on page 138)
- **Pulse Form**: Use this function to select the form of the transmitted pulse. This could either be FM (Frequency modulation) with different pulse lengths, or CW with different pulse lengths. (► *Pulse Form* on page 149)
- **TX Power**: This button controls the transmission power. (► *TX Power* on page 173)
- **TVG**: Time Varied Gain. This function will automatically adjust the gain in the sonar to compensate for geometric spread and absorption. Note that the TVG will only work within the first 1000 meters. (► *TVG* on page 172)
- **AGC**: Automatic Gain Control. This function will automatically reduce the gain if you experience reverberation and noise, or increase it if the conditions permit it. Using the AGC will ensure best possible signal processing. (► *AGC* on page 122)
- **RCG**: Reverberation Controlled Gain. This function will automatically remove unwanted reverberation from the bottom or from the sea surface. It may however also remove scattered fish. (► *RCG* on page 153)
- **PP Filter**: The Ping-to-Ping filter will only show you the echoes if they are still present after several consecutive pings (2, 4 or 8). This function will provide you with a more stable echo presentation, as spurious echoes will be suppressed. (► *PP Filter* on page 148)

Display menu

Menu description



The **Display** menu is shown in all display modes, and provides access to parameters controlling the visual presentation of the sonar views. Some of the choices on the menu are simple on/off buttons.

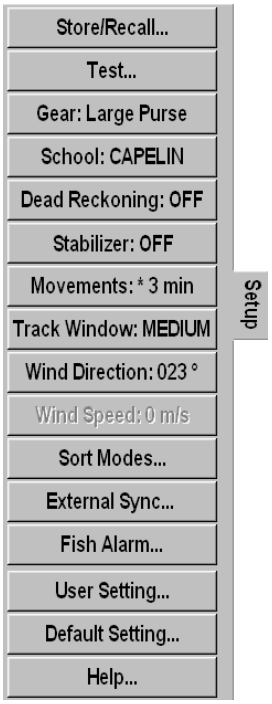
Menu buttons

- **Full screen**: Click this button to remove or retrieve the menu.
- **Palette**: Click this button to choose a presentation colour palette to suit your personal preferences. (► *Palette* on page 147)
- **Display Gain**: This function controls the amount of echo that are displayed. Use this control together with **Gain** to control the sonar's sensitivity. (► *Display Gain* on page 132)
- **Colour Threshold**: Click this button to control how many colours to use in the echo presentation. (► *Colour Threshold* on page 126)
- **Colours**: Control how bright colours you wish to use. The colour bar in the menu shows the colour range that is used.(► *Colours* on page 127)
- **Resolution**: Select 16 or 64 colours in the display presentation. The chosen resolution is shown in the colour bar below the button.
- **Panel Backlight**: This function controls the intensity of the backlight in the Operating Panel. (► *Panel Backlight* on page 147)

- **Mode buttons**: Use this button to choose how the **Mode** buttons on the Operating Panel shall work. You can either choose between the four most frequent modes, or the four most frequent user settings. (► *Mode Buttons* on page 145)
- **Language**: Choose the menu language. (► *Language* on page 141)
- **Units**: Allows you to choose the units used by the sonar.(► *Units* on page 173)
- **Cosmetics**: Click to access the **Cosmetics** menu, which allows you to control the amount of support information on the sonar picture. (► *Cosmetics menu* on page 103)
- **Bearing** (Display): Set up the sound channel bearing to be relative or related to true north. (► *Bearing (Display)* on page 124)
- **Menu**: Choose if you wish to see the complete menus (as described here), or just the most important settings. (► *Menu* on page 142)

Setup menu

Menu description



The **Setup** menu is shown in all display modes, and gives access to parameters controlling the processing and algorithms in the sonar system. It also provides access to specific system parameters and functions such as **Test** and **Store/Recall**.

Menu buttons

- **Store/Recall**: Click this button to record and playback sonar images. (► *Store/Recall menu* on page 104)

- **Test**: Click this button to access the sonar's test software. These utilities are only provided for certified service technicians, and they are not documented. (► *System Test menu* on page 105)
- **Gear**: This button is used to select the type of fishing gear you use, and to get the right size and position of the gear on the display. (► *Gear* on page 138)
- **School**: This parameter is used to obtain information of the volume estimation of a school in the automatic target tracking program. (► *School Data* on page 157)
- **Dead Reckoning**: This is an on/off function. When off, the GPS is used to calculate the position of your vessel. When on, the current speed and the input from the gyro is used. (► *Dead Reckoning* on page 129)
- **Stabilizer**: When this function is active, the sonar will automatically adjust the sonar picture to compensate for the ship's movements in the sea. (► *Stabilizer* on page 161)
- **Movements**: This function makes it possible to estimate the position of a tracked school at a given time. (► *Movements* on page 145)
- **Track window**: This command enables you to adjust the size of the window the sonar places on the chosen target. A larger track window will enable the system to track a large target more easily, but the system will be more susceptible to background noise. Smaller targets may be ignored if there is a lot of noise in the area, as the system will track the strongest echo within the track window. (► *Track Window* on page 169)
- **Wind direction**: The wind marker is show in the outer area of the echo presentation as a white arrow. This arrow can be manually adjusted for indication of the wind or current direction, or automatically show the wind direction if a wind sensor is connected. (► *Wind Direction* on page 175)
- **Wind speed**: This is not a parameter. It is only a read-out of the current wind speed providing that a wind sensor is connected. If the *Scientific Output* function has been implemented, this **Wind speed** button is replaced with the **Scientific Output** button.
- **Scientific Output**: This is an optional functionality designed to be used when the sonar is used for scientific purposes. When enabled, the sonar will provide special information on an ethernet port. This button replaces the **Wind speed** button. (► *Scientific Output* on page 157)

- **Sort modes**: Click to access the **Sort Modes** temporary menu. This menu is used to select the display modes to be activated by the four **Mode** buttons on the Operating Panel. The four upper display modes in the **Sort Modes** menu will always be the four modes activated by the four **Mode** buttons in the order they are sorted. (► *Sort Modes menu* on page 107)
- **External sync(hronisation)**: This function makes it possible to eliminate interference from other Simrad sonars on board your vessel. If the sonars are connected together, you can use these settings to synchronise their transmissions. (► *External Synchronisation* on page 135)
- **Fish alarm**: This function makes it possible to set up the sonar to warn you when a school of fish are detected inside the selected sector. The selected sector is displayed with white dashed lines in the horizontal sonar picture. (► *Fish Alarm* on page 136)
- **User setting**: This function is used to store the parameter settings for different type of fisheries, or individual user related settings. (► *User Setting* on page 174)
- **Default Setting**: Click this button to retrieve the default factory settings. (► *Default Setting* on page 130)

Objects menu

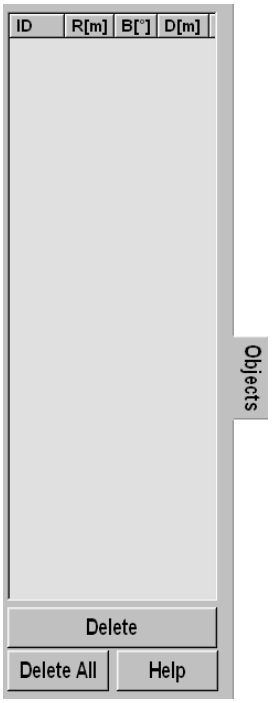
Menu description

The **Objects** menu is shown in all display modes, and displays the range (R), bearing (B) and depth (D) to all selected objects. The identifying abbreviations for the different objects are:

- **AT**: Automatic Target Track marker
- **Ci**: Circle marker
- **M**: Target marker
- **OS**: Own Ship marker
- **PT**: Position Track marker
- **F**: Radio Buoy marker (if a GPS buoy system is connected)

For additional information, see *Markers and symbols procedures* on page 45.

Using the Objects menu



- To delete an object, select the relevant marker in the list, and click the **Delete** button in the lower part of the menu.
- Click the **Delete All** button to delete all objects.
- The number behind the identifying abbreviation refers to the same number on the object in the sonar presentation. The **P** after the **Automatic Target Track** marker indicates the priority level where the audio channel is locked to the target.
- When selecting an object in the list, a list with all the available object data will be shown below the **Objects** menu. When selecting a **Target** marker, **Automatic Target Track** marker or a **Radio Buoy** marker in the list, a dotted bearing line from the vessel to the marker will be presented.
- The parameters for each marker are shown in the **Inspect Object** parameter dialog. Click on a marker to investigate its parameters. (► *Inspect Object* on page 140)

Menu buttons

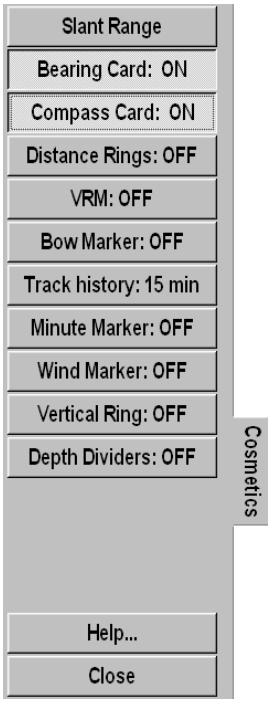
- **Delete**: Click this button to delete the currently selected object.
- **Delete All**: Click this button to delete all objects.
- **Help**: Click to open the on-line help.

Temporary menus

The temporary menus are those selected from the active menus. They are also shown with vertical tabs on the right side of the menu, and can easily be selected by the trackball and the **Select** button. The temporary menus must however be removed manually using the **Close** button in the bottom of menu. All temporary menus have access to on-line help through a **Help** button.

Cosmetics menu

Menu description



The **Cosmetics** menu is activated by pressing the **Cosmetics** button in the **Display** menu. The menu provides access to various parameters controlling the appearance of the sonar picture. All the functions - except **Track History** - are on/off buttons. For additional information, see *Display menu* on page 98 and *Cosmetics* on page 33.

- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

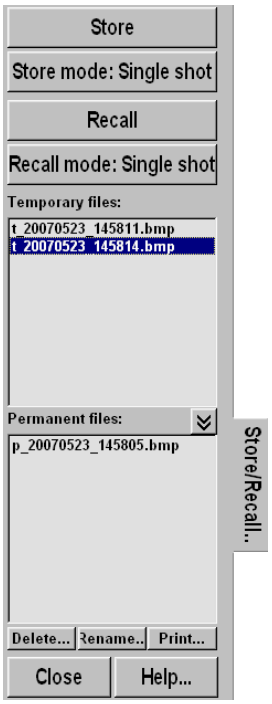
Menu buttons

- **Slant Range/True Range**: Allows you to choose the how the distance to the current target is calculated: the horizontal distance, or the distance along the tilt angle. (► *Slant Range* on page 159)
- **Bearing Card**: Displays the current bearing relative to the vessel.
- **Compass Card**: Displays short yellow lines for every 10th degree along the outer circle of the sonar view.
- **Distance Rings**: Displays dotted rings, each with a range read-out on the left hand side of the display centre.
- **VRM** (Variable Range Marker): Displays an adjustable range ring with range read-out. It can be used for any type of distance marking relative to the vessel.
- **Bow Marker**: Displays a heading marker, a dotted line drawn from the bow of your own ship in the same direction as the vessel's current heading.
- **Track History**: Allows you to add track lines on your own ship symbol. (► *Track History* on page 168)
- **Minute Marker**: Displays small circles on the track history of the ship, each with one minute apart.

- **Wind Marker**: Displays an arrow drawn from the Compass Card pointing towards the centre of the display, shows the current wind direction if a suitable sensor has been connected to the sensor.
- **Vertical Ring**: Displays the selected range of the vertical slice as a full circle in the horizontal presentation.
- **Depth Dividers**: Displays horizontal dotted lines used to visualize the depth steps in the vertical slices.

Store/Recall menu

Menu description



The **Store/Recall** menu is activated by the **Store/Recall** button in the **Setup** menu. This menu is used to store single display pictures or a sequence or pictures. The stored pictures can easily be recalled for evaluation or comparing schools. For additional information, see *Setup menu* on page 99 and *Storage procedures* on page 48.

- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

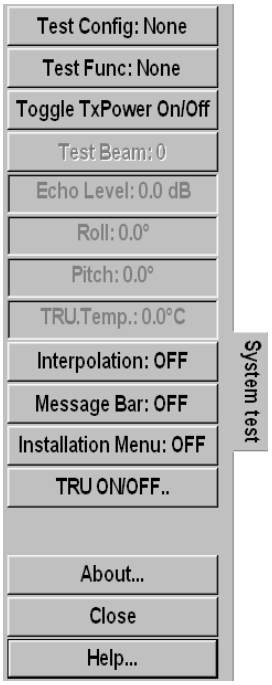
Menu buttons

- **Store**: This is the “record” button to start the storage sequence. (► *Store* on page 163)
- **Store Mode**: Allows you to decide what to store; single display pictures or a sequence or pictures. (► *Store Mode* on page 164)
- **Recall**: Retrieves the stored picture. (► *Recall* on page 154)
- **Recall Mode**: Allows you to decide what to recall. (► *Recall Mode* on page 154)
- **Temporary files**: This text field displays the list of current temporary files. These will be deleted when you switch off the sonar.

- **Transfer** button: Click this button: to transfer a selected preliminary file to the permanent file storage.
- **Permanent files**: This text field displays the list of permanent files. These will not be deleted when you switch off the sonar.
- **Delete**: Click this button to delete a selected file from either the temporary or permanent list.
- **Rename**: Click this button to rename a selected file on either the temporary or permanent list.
- **Print**: Click this button to print a selected file on either the temporary or permanent list.

System Test menu

Menu description



The **System test** menu is activated by the **Test** button in the **Setup** menu. This menu provides several sensor measurements and test functions for operational and functional tests. Note that tests are designed only to be carried out by qualified service engineers. From this menu you can also access the **Message Bar** configuration. For more information, see *Setup menu* on page 99.

- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

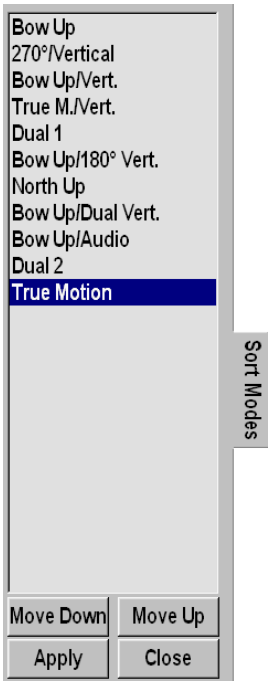
Menu buttons

- **Test Config(uration)**: This function is only to be activated by qualified service engineers.
- **Test Func(tion)**: This function is only to be activated by qualified service engineers.
- **Toggle TX Power On/Off**: This button allows you to switch the transmit power on and off. This function is only to be used during system testing, and never when the vessel is in dry dock
- **Test beam**: This function is only to be activated by qualified service engineers.

- **Echo level**: This button provides a read-out of the current noise in the waters surrounding the vessel. This noise is caused by air bubbles, water flow and mechanical disturbances from hull and engine.
- **Roll**: This button provides a read-out from the roll sensor. It presents the actual roll value at the time of the last transmission.
- **Pitch**: This button provides a read-out from the pitch sensor. It presents the actual pitch value at the time of the last transmission.
- **TRU Temp**: This button provides a read-out of the current temperature inside the Transceiver Unit. If the temperature rises to an unacceptable level, an alarm will be given.
- **Interpolation**: This is a built-in software function that may give a more realistic presentation of the echoes.
- **Message bar**: This button opens the **Message bar** parameter dialog, which allows you to monitor operational messages from the sonar. (► *Message Bar* on page 142)
- **Installation menu**: This button opens the **Installation** menu on the top of the display. This menu is used during installation of the sonar, and information about this is provided in the *Installation manual*.
- **TRU ON/OFF**: This button allows you to switch the Transceiver Unit on or off. Two dialog boxes provide you with the status of this process.
- **About**: This button provides access to a small information dialog providing the current software version. (► *About* on page 122)

Sort Modes menu

Menu description



The **Sort Modes** menu is activated by the **Sort Modes** button in the **Setup** menu. (► *Setup menu* on page 99)

This menu is used to select the display modes to be activated by the four **Mode** buttons on the Operating Panel. The four upper display modes in this menu will always be the modes selected by the four **Mode** buttons in the order they are sorted. In order to sort the modes, click on a mode to select it, and click the **Move Up** and **Move Down** buttons to move the selected mode up or down the list. When the modes are organized in the requested order, click the **Apply** button to save the setting, and **Close** to close the menu. For additional information, see *Mode procedures* on page 43.

- The **Close** button closes this menu.

Menu buttons

- **Move down**: Click to move the selected display mode down on the list.
- **Move up**: Click to move the selected display mode up on the list.
- **Apply**: Apply the current list of display modes. The four top modes can then be selected using the **Mode** buttons on the Operating Panel.
- **Close**: Close the menu.

Pop-up menus

The pop-up (short-cut) menus are opened using the **View** and **Object** buttons on the Operating Panel, or the middle and right mouse buttons if an optional computer mouse is installed. Each button will present a small menu appearing at the cursor's current location. To make a selection, position the arrow cursor by means of the trackball. Then, press the **Select** button on the Operating Panel or the left mouse button.

View pop-up menu

The **View** pop-up menu is opened using the **View** button on the Operating Panel (or the middle mouse button if an optional computer mouse is installed).

Menu options

- **Set New Display Centre**: When this function is selected, the new display centre is moved to the cursor's position where the **View** menu was activated.
- **Ship To Centre**: When this function is selected, the own ship symbol is moved to the centre of the view.
- **Zoom**: The zoom function magnifies an area of the display by positioning the cursor in its centre and pressing the **Zoom** button. Within the sonar presentation area, the **Zoom** button works as a toggle switch for on/off of the zoom function. In the text area of the screen (the four corners), the **Zoom** button works in steps.
- **Erase Echoes**: When this function is selected, all echoes displayed on the sonar view will be deleted.
- **Synchronize** - This function is not operational on the sonar. For synchronization to external equipment, refer to the **Setup** menu.
- **Make Same Size**: When this function is selected, window areas tiled vertically will acquire the same width.
- **Grey scale data**: This command changes the display from a colour presentation to a black-and-white. The number of shades of grey and the number of different colours used will be the same. The grey scale presentation can be selected for singular sonar views independent of each other. Click one more time to restore the colours.
- **View Menu**: When this function is selected menus will be displayed according to the view in which the cursor is situated. Several different **View** menus are available.

Catch View pop-up menu

The **Catch View** pop-up menu is opened by pressing the **View** button on the Operating Panel (or the middle mouse button) when the cursor is located in a *Catch Data* view.

Menu options

- **Erase Echoes**: When this function is selected, all echoes displayed on the sonar view will be deleted.
- **Make Same Size**: When this function is selected, window areas tiled vertically will acquire the same width.
- **Grey scale data**: This command changes the display from a colour presentation to a black-and-white. The number of shades of grey and the number of different colours used will be the same. The grey scale presentation can be selected for singular sonar views independent of each other. Click one more time to restore the colours.
- **View Menu**: When this function is selected menus will be displayed according to the view in which the cursor is situated. Several different **View** menus are available.

Object pop-up menu

The **Object** pop-up menu is opened using the **Object** button over the trackball on the Operating Panel, or the right mouse button if an optional computer mouse is installed. This pop-up menu is mainly used when you operate the sonar from an optional mouse, as most of the functions on it can be selected directly on the Operating Panel. Note that the cursor related selections in the **Object** pop-up menu use the cursor position where the pop-up menu was activated.

For more information about the **Object** on the Operating Panel, see *'Cursor' field* on page 86.

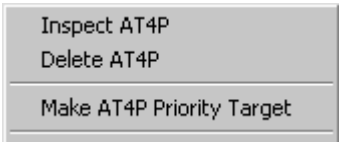
Basic parameters

These majority of the menu options on the basic **Object** pop-up menu provide the same functions as their respective buttons on the Operating Panel:

- **Target Track**: This option provide the same function as the **Target Track** button on the Operating Panel. See *'Train' field* on page 88.
- **Position Track**: This option provide the same function as the **Position Track** button on the Operating Panel. See *'Train' field* on page 88
- **Set Marker**: This option provides the same function as the button on the Operating Panel. See *'Symbol' field* on page 83.
- **New Own Ship Marker**: This option provides the same function as the button on the Operating Panel. See *'Symbol' field* on page 83.
- **Circle Marker**: This option provides the same function as the button on the Operating Panel. See *'Symbol' field* on page 83.
- **New Ruler**: When this function is selected, a straight line is drawn from the current cursor position (where the **Object** pop-up menu was selected) to another selected position. The ruler will display range and bearing between the two points. To remove the ruler, click on it with the right mouse button, and select **Remove Ruler** from the **Object** pop-up menu. (► *Ruler* on page 155)
- **Gear Symbol**: This option provides the same function as the button on the Operating Panel. See *'Symbol' field* on page 83.

Target parameters

When you open the **Object** pop-up menu with the cursor positioned over a defined object (marker) on the display, it will display additional parameters.



- **Inspect [object]**: This option opens a parameter dialog with detailed information about the current target. See *Inspect Object* on page 140.
- **Delete [object]**: When this function is selected, the object will be removed. This is the same function as provided by the **Objects** menu.
- **Make [object] Priority Target**: This function can be used to give priority to an "old" target tracking symbol, which locks the audio channel on the target.

Ruler parameters

When you open the **Object** pop-up menu with the cursor positioned over a ruler on the display, it will display additional parameters.

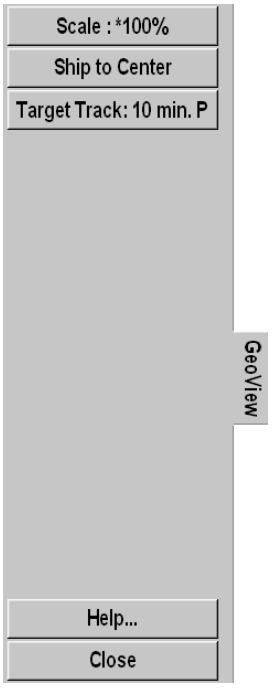
- **Delete Ruler**: Removes a ruler from the display.
- **Inspect Ruler**: If you click on an existing ruler, the **Ruler** parameter dialog will appear under the menu. This dialog provides information about the selected ruler, and it allows you to remove the ruler with a **Delete** button. (► *Inspect Object* on page 140)

View menus

The view menus are activated from the **View** pop-up menu, which again is opened using the **View** button on the Operating Panel or the middle mouse button. The view menus are shown with vertical tabs on the right hand side, and the menus can easily be closed using the **Close** button in the lower part of each menu. All menus have access to on-line help through a **Help** button.

GeoView menu

Menu description



The **GeoView** menu is activated by pressing the **View** button on the Operating Panel or the middle mouse button in any horizontal view, and then selecting **View Menu** in the **View** pop-up.

The **GeoView** menu provides control of selected parameters related to the current data displayed in the horizontal view; the scale and target track. It also provides you with a button to reposition the vessel symbol. The **GeoView2** menu is identical to the **GeoView**. It is shown when you operate in the second view in a *Dual 1* or *Dual 2* operational modes.

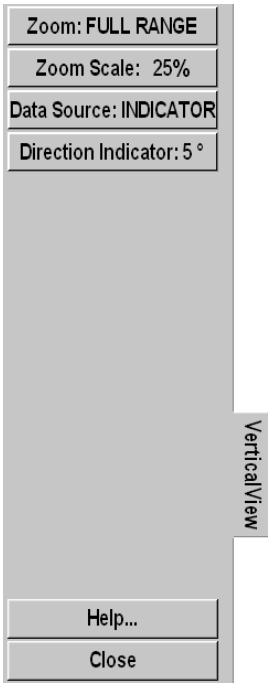
- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

Menu buttons

- **Ship to centre**: Click this button to move the ship symbol to the centre of the view.
- **Scale**: Click this button to select the scale of the horizontal presentation. 100% is the default scale. (► *Scale* on page 156)
- **Target Track**: This button is used to show the movement history of a selected target. The history is displayed as a line after the target symbol. Straight line segments are drawn between each position fix, and minute markers may be added along the line. (► *Target Track* on page 165)

VerticalView menu

Menu description



The **VerticalView** menu is activated by pressing the **View** button on the Operating Panel (or the middle mouse button) while positioning the cursor in any of the vertical views, and then selecting **View menu** in the **View** pop-up.

This menu provides control of selected parameters related to the current data displayed in the vertical view. Note that the **Direction Indicator** is only available when **Indicator** is selected in the **Data Source** parameter dialog.

- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

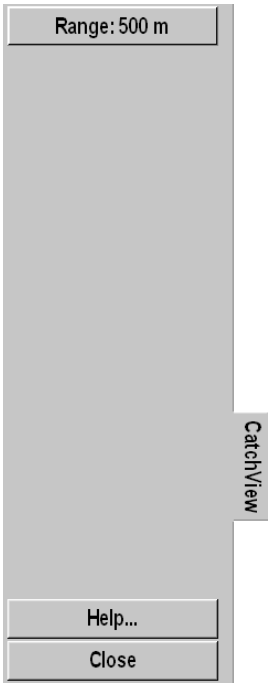
Menu buttons

- **Zoom**: Click this button to zoom in on the vertical view around the trawl symbol or the bottom. To zoom in on the bottom, an external echo sounder must be connected to the sonar. (► *Zoom* on page 176)
- **Zoom Scale**: Use this button to define the zoom scale around the Trawl symbol or the bottom. (► *Zoom Scale* on page 177)

- **Data Source**: This button is used to select the bearing source of the vertical views. If you select **Audio**, the vertical slice will follow the trainable audio channel. If you select **Indicator**, the bearing of the vertical slice can be adjusted independent of the audio channel. (► *Data Source* on page 128)
- **Direction Indicator**: This feature allows you to train the vertical slices independent of the audio channel. The direction indicator is shown in the horizontal presentation as a yellow dotted line. (► *Direction Indicator* on page 131)

CatchView menu

Menu description



The **CatchView** menu is activated by pressing the **View** button on the Operating Panel (or the middle mouse button) while the cursor is located in the *Catch* view, and then selecting **View menu** in the **View** pop-up.

This menu provides control of selected parameters related to the current data displayed in the *Catch* view. Note that the *Catch* view is only available in the *270°/Vertical*, *True Motion/Vertical* and *Bow up/Vertical* display modes, and you may need to hide the menu to see it.

- The **Close** button closes this menu.
- The **Help** button opens the on-line help.

Menu buttons

- **Range**: Click this button to select the horizontal range. (► *Range (CatchView)* on page 152)

Messages

When necessary, the sonar will provide you (or your service engineer) with operational and technical messages. These messages are sorted into four categories;

1 Warnings

2 Operator alarms

3 System alarms

4 Errors

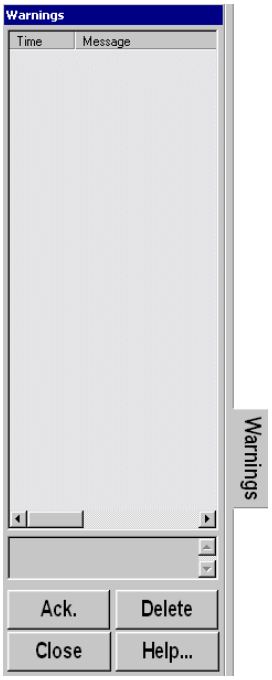
In order to access the messages, the **Message Bar** must be enabled. This function can be set to activate itself when necessary. The **Message Bar** is located at the bottom of the display, and it contains four buttons, one for each category of messages. These buttons give an overview of the number of unread messages currently in the system. Each of the four buttons gives access to a dialog where each message can be read, acknowledged and deleted. When no messages are present, the four buttons are grey. When one or more unread messages exists, the **Warning** and **Operational Alarm** buttons are yellow, while the **System Alarm** and **Error** buttons are red.

Figure 32 The Message Bar buttons

For more information, see *Message Bar* on page 142

Warnings menu

Menu description



The **Warnings** menu is activated from the **Warnings** button in the **Message Bar**. (► *Message Bar* on page 142)

The menu displays the warning messages issued by the sonar.

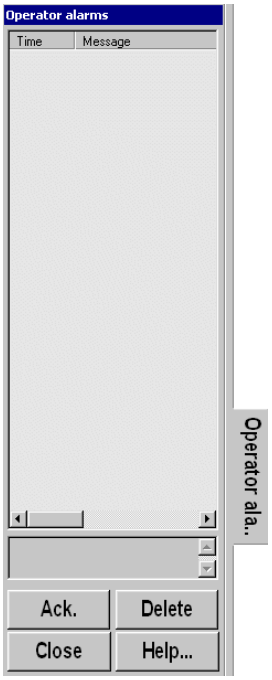
Each message is identified with time of issue and a heading. Additional information is found in the small text field below the message list. The top of the message list with the most recent messages is always displayed when the dialog is opened. Acknowledged messages are displayed in grey. Use the cursor and select individual messages with the **Select** button on the Operating Panel. For more information, see *'Cursor' field* on page 86 and *Message Bar* on page 142.

Menu buttons

- **Ack(knowledge)**: Press this button to acknowledge the selected message
- **Delete**: Press this button to delete the selected message.
- **Close**: Click this button to close the menu.
- **Help**: Click to open the on-line help system.

Operator Alarms menu

Menu description



The **Operator Alarms** menu is activated from the **Op Alarms** button in the **Message Bar**. (► *Message Bar* on page 142)

The menu displays the operator alarms issued by the sonar.

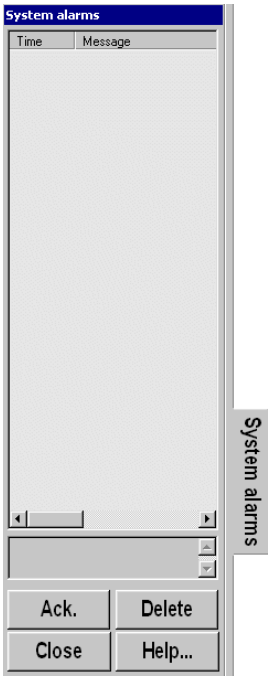
Each message is identified with time of issue and a heading. Additional information is found in the small text field below the message list. The top of the message list with the most recent messages is always displayed when the dialog is opened. Acknowledged messages are displayed in grey. Use the cursor and select individual messages with the **Select** button on the Operating Panel. For more information, see *'Cursor' field* on page 86 and *Message Bar* on page 142.

Menu buttons

- **Ack(knowledge)**: Press this button to acknowledge the selected message
- **Delete**: Press this button to delete the selected message.
- **Close**: Click this button to close the menu.
- **Help**: Click to open the on-line help system.

System Alarms menu

Menu description



The **System Alarms** menu is activated from the **Sys Alarms** button in the **Message Bar**. (► *Message Bar* on page 142)

The menu displays the system alarms issued by the sonar.

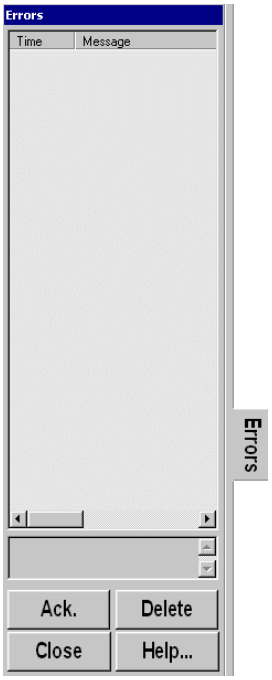
Each message is identified with time of issue and a heading. Additional information is found in the small text field below the message list. The top of the message list with the most recent messages is always displayed when the dialog is opened. Acknowledged messages are displayed in grey. Use the cursor and select individual messages with the **Select** button on the Operating Panel. For more information, see *'Cursor' field* on page 86 and *Message Bar* on page 142.

Menu buttons

- **Ack(knowledge)**: Press this button to acknowledge the selected message
- **Delete**: Press this button to delete the selected message.
- **Close**: Click this button to close the menu.
- **Help**: Click to open the on-line help system.

Errors menu

Menu description



The **Errors** menu is activated from the **Errors** button in the **Message Bar**. (► *Message Bar* on page 142)

The menu displays the error messages issued by the sonar.

Each message is identified with time of issue and a heading. Additional information is found in the small text field below the message list. The top of the message list with the most recent messages is always displayed when the dialog is opened. Acknowledged messages are displayed in grey. Use the cursor and select individual messages with the **Select** button on the Operating Panel. For more information, see *'Cursor' field* on page 86 and *Message Bar* on page 142.

Menu buttons

- **Ack(knowledge)**: Press this button to acknowledge the selected message
- **Delete**: Press this button to delete the selected message.
- **Close**: Click this button to close the menu.
- **Help**: Click to open the on-line help system.

PARAMETERS

This section provides a detailed description of the parameter dialogs used by the Simrad SH90 sonar system.

The chapter *Menu structure* gives a description of the menu system configuration with references to more detailed descriptions of all the menu. Any selections you do in the menus will bring up the parameters available for the chosen setting. The *Alphabetical list of parameters* is a useful aid to find a description of a particular parameter of all available parameters incorporated in the Simrad SH90 sonar system.

- *About the parameter dialogs* on page 119
- *Alphabetical list of parameters* on page 121
- *Parameter descriptions* on page 122

About the parameter dialogs

When a parameter is selected, the available choices are shown in the dialog below the menu. The setting is then made using the available buttons or lists. Several levels are frequently used to select the parameters. Note that:

1. In many cases you will not need to open the parameter dialog, as you can control the settings directly on the menu button.
2. The parameter is selected and activated by the sonar once it is highlighted in the dialog. The operational changes can thus be investigated from within the dialog without closing it.
3. The **Close** button will always close the dialog.
4. The **Help** button will always provide short-form context sensitive help. This help text will appear on top of the parameter dialog, and you need to click **Close** to return. In the help window you can also click **Free** to access to full interactive manual. This may not be available in all modes, as it will block the view of the sonar echoes. Once the interactive manual has been opened, you need to click **Free** one more time to reduce the large help window back to the short-form presentation. If you click **Close** in the large help window, the same large window will automatically appear next time you click **Help** in a parameter dialog. For more information, see *On-line help* on page 36.

The menu settings marked with an asterisk, indicate the normal setting which perform well under normal conditions. If one got lost in the menu settings, a *Default Settings* function will bring up these normal settings. After experience, when the contents of

the menus are better known, the increase/decrease function on the actual menu button can be used directly without opening the parameter dialog.

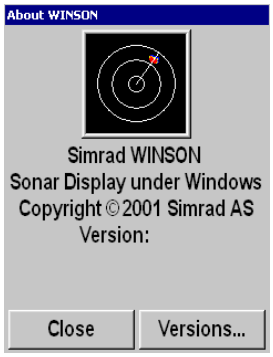
Alphabetical list of parameters

About on page 122
AGC on page 122
Beam on page 123
Bearing (Display) on page 124
Bearing (Horizontal) on page 125
Bearing (Vertical) on page 126
Colour Threshold on page 126
Colours on page 127
Data Source on page 128
Date and time properties on page 129
Dead Reckoning on page 129
Default Setting on page 130
Density on page 131
Direction Indicator on page 131
Display Gain on page 132
Edit Gear (Purse) on page 133
Edit Gear (Trawl) on page 134
Edit School on page 135
External Synchronisation on page 135
Fish Alarm on page 136
Gain on page 138
Gear on page 138
Heading on page 139
Inspect Object on page 140
Language on page 141
Menu on page 142
Message Bar on page 142
Middle Pos(ition) on page 143
Mode on page 144
Mode Buttons on page 145
Movements on page 145
Noise Filter on page 146
Palette on page 147
Panel Backlight on page 147
PP Filter on page 148
Pulse Form on page 149
Range on page 151
Range (CatchView) on page 152
RCG on page 153
Recall on page 154
Recall Mode on page 154
Ruler on page 155
Scale on page 156
School Data on page 157
Scientific Output on page 157
Search Sector on page 158
Search Step on page 159
Slant Range on page 159
Speed on page 160
Stabilizer on page 161
Status on page 162
Store on page 163
Store Mode on page 164
Target Track on page 165
Tilt on page 166
Tip on page 167
Track History on page 168
Track Window on page 169
Transducer on page 169
True Range on page 172
TVG on page 172
TX Power on page 173
Units on page 173
User Setting on page 174
Wind Direction on page 175
Zoom on page 176
Zoom Scale on page 177

Parameter descriptions

About

Dialog description



The **About** parameter dialog is opened with the **About** button on the **System test** menu.

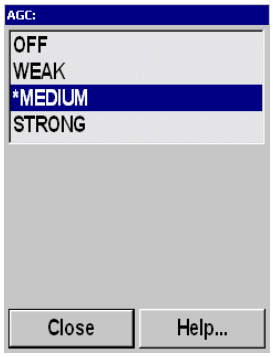
The **About** dialog is only used to provide information about the current software version. In addition, the **Versions** button opens a small text document with detailed system information. This information is not intended for operational use.

Related topics

- *System Test menu* on page 105

AGC

Dialog description



The **AGC** parameter dialog opens when you click the **AGC** button in the **Horizontal**, **Vertical** and **Vertical 180** menus.

The **AGC (Automatic Gain Control)** function adjusts the gain in the sonar's preamplifier circuitry. This gain depends on the strength of the incoming echo signal. The result is a filter effect, reducing noise and reverberation. As show in the menu, the AGC has four different settings.

AGC dialog options

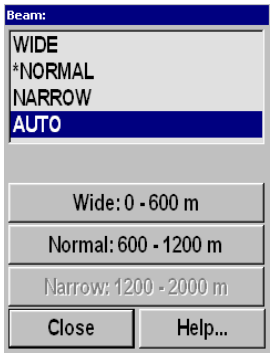
- **Off**: No gain adjustment
- **Weak**: Slow gain adjustment
- **Medium**: Medium fast gain adjustment
- **Strong**: Fast gain adjustment
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96
- *What is AGC?* on page 179

Beam

Dialog description



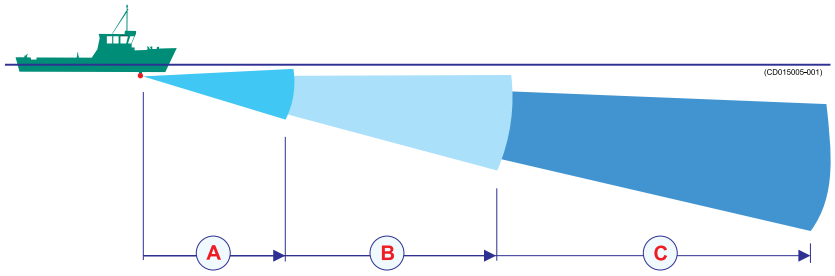
This parameter dialog opens when you click the **Beam** button in the **Horizontal** menu.

This function enables you to select the vertical beam width in the horizontal presentation. The beam selection can be made manually, or controlled automatically by the selected range.

- The *wide* beam is designed to be used with shorter ranges in order to obtain a larger vertical coverage. This makes the sonar less “tilt dependent” in the catching phase.
- The *normal* beam is designed to be used for the medium ranges.
- The *narrow* beam is provided for the longer ranges. The focused narrow beam has the highest source level, which increases the detection range.

In automatic mode, the beam will change automatically as defined by the range selections made by the **Wide** and **Normal** buttons.

Figure 33 Beam widths: Wide (A), Normal (B) and Narrow (C)



Beam dialog options

- **Wide**: Click this button to select the upper range for the wide beam width in *Auto* mode. For ranges higher than this selection, the beam will automatically switch to *Normal* or *Narrow* depending on the current selection for the **Normal** button.
- **Normal**: Click this button to select the upper range for the normal beam width in *Auto* mode. For ranges higher than this selection, the beam will automatically switch to *Narrow*, which is indicated by a grey and unavailable **Narrow** button.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Horizontal menu* on page 93

Bearing (Display)

Dialog description

Bearing: True North

Bearing: Relative Ship

The **Bearing (Display)** parameter is activated when you click the **Bearing** button in the **Display** menu.

This is simply a selector switch. Click on the button to select *True north* or *Relative Ship*. Certain bearing data will change their values accordingly. The following bearing data will change when you switch between the two settings:

- Cursor bearing
- Markers bearing in the **Objects** menu
- Target positions in the catch data views

Note

There are no indication on any of these read-out values to identify them as relative or true.

All other bearing data remain permanent, and will not change when you select relative or true bearing. This includes:

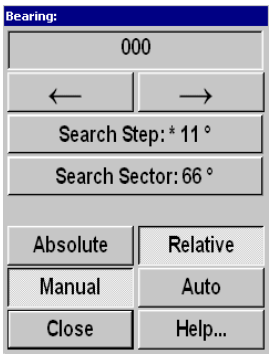
- Wind direction is always relative to true north
- Audio line is always relative to the ship's heading
- Ship's current heading is always relative to true north
- Target's current heading is always relative to true north

Related topics

- *Display menu* on page 98
- *Objects menu* on page 101

Bearing (Horizontal)

Dialog description



The **Bearing** parameter dialog opens when you click the **Bearing** button in the **Horizontal** menu.

The horizontal bearing of the audio channel is normally controlled from the Operating Panel. The selected bearing is shown with a continuous white line pointing out from the transducer position. This line can be trained manually or automatically in any position.

Bearing dialog options

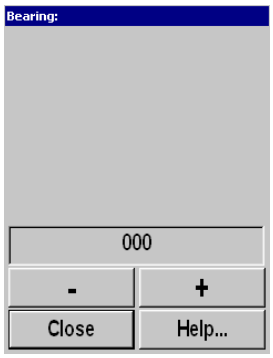
- **Left/Right arrow**: Click once to train the audio channel one degree. The current bearing is shown above.
- **Search Step**: Click to open a new parameter dialog that allows you to select the search step angle. This value defines how many degrees the search beam shall move for each transmission in the *Auto Search* mode. (► *Search Step* on page 159)
- **Search Sector**: Click to open a new parameter dialog that allows you to select the active audio search sector. This sector can be adjusted between 22 and 360 degrees directly with the increase/decrease button function, or by the two buttons in the **Search Sector** parameter dialog. The search sector limits are shown on the outer part of the echo circle with two white angular symbols. (► *Search Sector* on page 158)
- **Absolute/Relative**: Click **Absolute** to make the search sector relative to true north. Click **Relative** to make the search sector relative to the vessel's bow.
- **Manual/Auto**: In *Manual* mode, the audio channel can be trained continuously in either direction by pressing the two arrow buttons in the **Train** field on the Operating Panel. In *Auto* mode, the sonar will automatically perform search within the selected search sector using the steps defined.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Automatic search and tracking procedures* on page 54
- *Horizontal menu* on page 93
- *'Train' field* on page 88

Bearing (Vertical)

Dialog description



The **Bearing (Vertical)** parameter dialog opens when you click the **Bearing** button in the **Vertical** and **Vertical 180** menus.

This dialog allows you to train the audio channel bearing manually. The bearing of the audio channel is normally controlled with the **Train** buttons on the Operating Panel. The bearing of the vertical slice, which is presented by the white audio line in the horizontal picture, may also be trained by the **Bearing** button in the **Horizontal** menu.

For more information about the **Train** buttons, see *'Train' field* on page 88.

Bearing (Vertical) dialog options

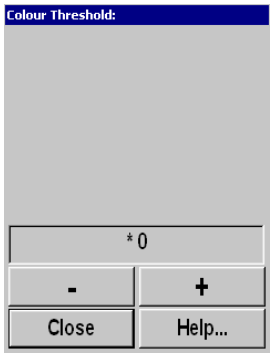
- + (plus): Allows you to increase the bearing angle.
- – (minus): Allows you to decrease the bearing angle.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

Colour Threshold

Dialog description



The **Colour Threshold** parameter dialog opens when you click the **Colour Threshold** button in the **Display** menu.

This function is used to reduce the number of echo colours on the display. The strength of the echoes is indicated with a scale of 16 or 64 colours. A weak echo has a cold colour (blue), medium echoes have warmer colours (green, yellow) and strong echoes are shown with the warmest colours (orange, red). If desired, the number of colours may be reduced. When you do this, the sonar will start with the colour indicating the weakest echoes. Therefore, by reducing colours, the maximum detection range will be reduced, because all echoes will normally appear as weak echoes at long ranges.

The selected colour threshold is reflected in the colour bar in the **Display** menu.

Colour Threshold dialog options

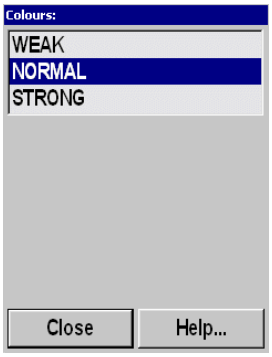
- + (plus): Click to increase the colour threshold.
- – (minus): Click to decrease the colour threshold.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98
- *Colours* on page 127

Colours

Dialog description



The **Colours** parameter dialog opens when you click the **Colours** button in the **Display** menu.

The colour strength of the echo presentation can be selected with three different colour scales. Under normal conditions, normal colours will give the best dynamic in the echo presentation, while strong colours are preferred for weaker echoes. The selected colour strength is reflected in the colour bar in the **Display** menu. Do not confuse this parameter with the **Colour Threshold** setting.

Colours dialog options

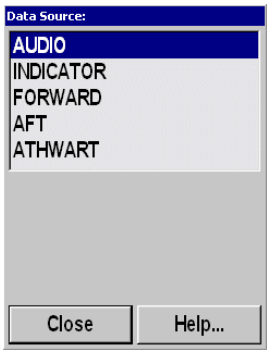
- **Weak**: Click to use weaker colours on the sonar presentations.
- **Normal**: Click to use normal colours on the sonar presentations.
- **Strong**: Click to use strong colours on the sonar presentations.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98
- *Colour Threshold* on page 126

Data Source

Dialog description



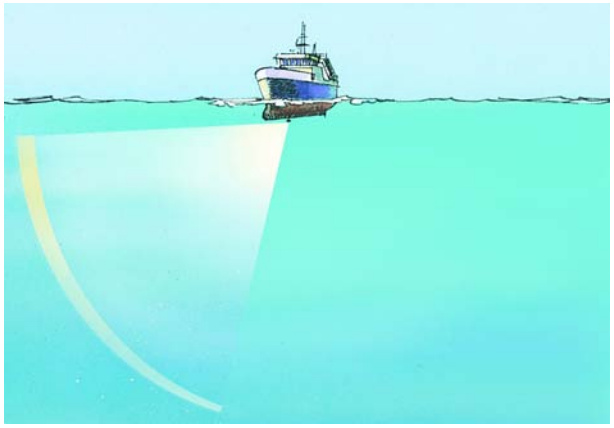
The **Data Source** parameter dialog opens when you click the **Data Source** button in the **VerticalView** menu.

The **VerticalView** menu is opened by pressing the **View** button on the Operating Panel (or the middle mouse button) while positioning the cursor in any of the vertical views, and then selecting **View menu** on the **View** pop-up menu.

The **Data Source** parameter dialog is used to select the bearing source of the vertical views.

The vertical view principle

The vertical slice cuts through the water column from the sea surface and down towards the bottom. The slice is rather narrow, but you can point it to any direction according to the settings described above.



This vertical slice, which is presented by the white audio line in the horizontal picture, can be selected to any bearing by the manual training control. The combination of the Omni mode and the vertical slice will give an optimal visualization of the catch situation.

Data Source dialog options

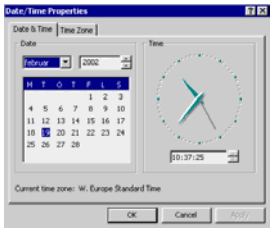
- **Audio**: Click to allow the vertical slice to follow the direction of the trainable audio channel.
- **Indicator**: Click to allow that the vertical slice can be adjusted independent of the audio channel. The adjustment is carried out by means of the **Direction Indicator** parameter.
- **Forward**: Click to force the vertical slice to face forward.
- **Aft**: Click to force the vertical slice to face aft.
- **Athwart**: Click to force the vertical slice to face athwart.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *VerticalView menu* on page 112
- *Direction Indicator* on page 131

Date and time properties

Dialog description



The **Date and time properties** dialog box is opened by pressing the **Time** or **Date** buttons in the default **Status** parameter dialog at the bottom of the menus.

The **Date and time properties** dialog box is provided by the sonar's operating system, and it is used to change time, date and time zone settings. The time and date information is battery powered and stored in the memory when the sonar is switched off.

Date and time dialog options

- **Time adjustment**: Use the cursor and select the actual digit. Then use the two arrow buttons in the spin box to adjust.
- **Date adjustment**: Use the spin boxes and the calendar to change month, year and date.
- **Time zone**: Use the list box to select your geographical position for the correct time zone.

Related topics

- *Status* on page 162

Dead Reckoning

Dialog description

The **Dead Reckoning** parameter is activated when you click the **Dead Reckoning** button in the **Setup** menu.

The **Dead Reckoning** function is used to improve the position of the historical track line from the vessel, relative to the actual position of the drifting fishing gear. In order to get correct dead reckoning, a Doppler speed log must be connected to the sonar. When **Dead Reckoning** is switched off, the vessel movement and track line will be calculated from the GPS data, which then will be relative to the bottom. When switched on, the inputs from the gyro and speed log are used to positioning the vessel relative to the water.

About Dead Reckoning

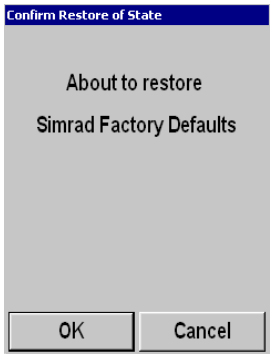
Dead reckoning is the process of estimating one's current position based upon a previously determined position, or fix, and advancing that position based upon measured velocity, time, heading, as well as the effect of currents or wind. While this method of navigation is no longer considered primary in ships, it is still often used as a backup in case of failure of the electronic navigation systems. Dead reckoning begins with a known position, or fix. This fix is then advanced, mathematically, by means of recorded heading, velocity, and time. The velocity is determined by means of the Doppler log.

Related topics

- *Setup menu* on page 99

Default Setting

Dialog description



The **Default Setting** parameter dialog opens when you click the **Default Setting** button in the **Setup** menu.

This function makes it possible to delete all the parameters currently saved in the sonar's memory, and reinstall those defined by Simrad instead; the factory default settings. These default settings are identified with an asterisk in the different parameter dialogs and menus, and will perform well under normal conditions.

Default Settings dialog options

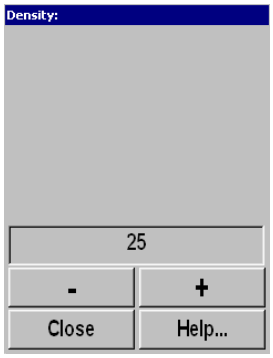
- **OK**: Click to load default settings. Note that the settings take effect immediately, and the sonar will automatically switch to the *Bow up* display mode.
- **Cancel**: Click to cancel the operation. The parameter dialog will close, and no default settings will be loaded.

Related topics

- *Setup menu* on page 99

Density

Dialog description



The **Density** parameter dialog opens when you click the **Edit** button in the **Edit School** parameter dialog. The **Edit School** is in turn opened from the **School Data** button on the **Setup** menu.

This parameter dialog is used to define the density of the current fish species.

The default density value is 25 kg/m². You may adjust this value based on your own experience from know catches.

Density dialog options

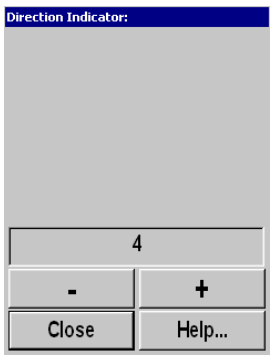
- + (plus): Allows you to increase the density.
- – (minus): Allows you to decrease the density.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Edit School* on page 135
- *School Data* on page 157

Direction Indicator

Dialog description



The **Direction Indicator** parameter dialog opens when you click the **Direction Indicator** button in the **VerticalView** menu. Note that **Data Source** must be set to *Indicator* in order to access this parameter.

The **VerticalView** menu is activated by pressing the **View** button on the Operating Panel (or the middle mouse button) while positioning the cursor in any of the vertical views, and then selecting **View menu** on the **View** pop-up.

This feature allows you to train the vertical slices independent of the audio channel. The *Direction Indicator* is shown in the horizontal presentation as a yellow dotted line.

Direction Indicator dialog options

- + (plus): Click to increase the direction angle.

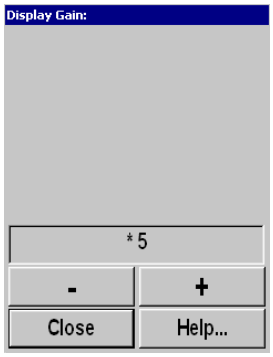
- – (minus): Click to decrease the direction angle.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Data Source* on page 128

Display Gain

Dialog description



The **Display Gain** parameter dialog opens when you click the **Display Gain** button in the **Display** menu.

These settings increase or decrease the presentation of the echo colours on the display. In order to adjust the receiver gain, refer to the individual **Gain** parameters available from the **Horizontal** and **Vertical** menus.

Display Gain options

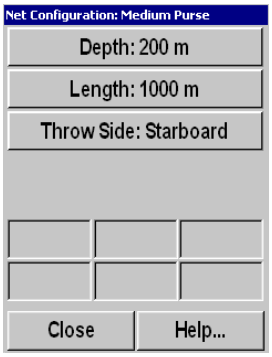
- + (plus): Click to increase the display gain.
- – (minus): Click to decrease the display gain.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98
- *Gain* on page 138

Edit Gear (Purse)

Dialog description



The **Gear** parameter dialog opens when you click the **Gear** button on the **Setup** menu. Each of the available options in the **Gear** dialog can be edited using the **Edit** button. When a purse has been selected, this **Edit Gear** parameter dialog is provided.

These parameters allows you to define the depth and the length of your purse seine, as well as which side of the vessel it is positioned.

Edit Gear (Purse) dialog options

- **Depth**: Click to enter the depth of your purse seine. When the **Gear** symbol is selected, the depth of the purse seine will be shown on all vertical views.
- **Length**: Click to enter the length of your purse seine. When the **Gear** symbol is selected, the seine circle will be shown in correct size. A dedicated parameter dialog is used to make this setting.
- **Throw Side**: Click to position the seine circle on the port or starboard side of the vessel. A dedicated parameter dialog is used to make this setting.
- **Sink rate**: Click to enter the expected sink rate of the gear.

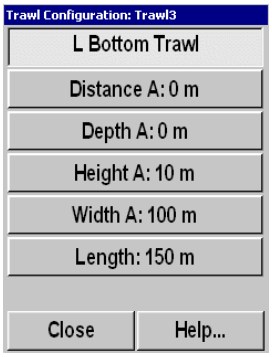
  If a depth sensor is connected to the sonar, this option is removed.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Gear* on page 138
- *Edit Gear (Trawl)* on page 134

Edit Gear (Trawl)

Dialog description



The **Gear** parameter dialog opens when you click the **Gear** button on the **Setup** menu. Each of the available options in the **Gear** dialog can be edited using the **Edit** button. When a trawl has been selected, this **Edit Gear** parameter dialog is provided.

These parameters allows you to monitor or define the distance and depth of your trawl, as well as the height and width of your trawl opening. If you use the Simrad ITI system, these parameters will be provided automatically.

Edit Gear (Trawl) dialog options

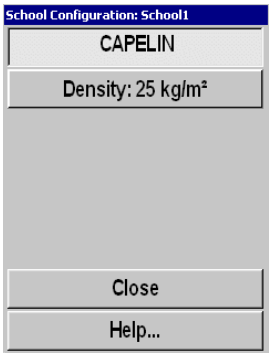
- **Distance**: Click to define the distance to the trawl. The setting is automatically if you click the **Auto** button, provided that a Simrad trawl system is connected to the sonar. If you click **Manual**, you can define the distance in steps of 10 meters.
- **Depth**: Click to define the depth of the trawl. The setting is made automatically if you click the **Auto** button, provided that a Simrad trawl system is connected to the sonar. If you click **Manual**, you can define the depth in steps of 10 meters.
- **Height**: Click to define the height of the trawl opening. The setting is made automatically if you click the **Auto** button, provided that a Simrad trawl system is connected to the sonar. If you click **Manual**, you can define the height in steps of 1 meter.
- **Width**: Click to define the width of the trawl opening. The setting is made automatically if you click the **Auto** button, provided that a Simrad trawl system is connected to the sonar. If you click **Manual**, you can define the width in steps of 10 meters.
- **Length**: Click to define the length of the trawl symbol on the sonar display.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Gear* on page 138
- *Edit Gear (Purse)* on page 133

Edit School

Dialog description



The **Edit School** parameter dialog opens when you click the **School Data** button on the **Setup** menu. In the **School Data** dialog, select requested species and click **Edit**. The top button displays the fish species selected in the **School Data** dialog.

This dialog displays the species of fish and its presently selected density. The density for the school volume estimation is based on kg/m² school area. The default value is 25 kg/m² for all species, and you may adjust this figure individually in the **Density** parameter dialog opened from the **Density** button.

Edit School dialog options

- **Density**: Click to select density in kg/m² for the currently selected species.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *School Data* on page 157

External Synchronisation

Dialog description

The **External Synchronisation** parameter dialog opens when you click the **External Sync** button on the **Setup** menu.

This function makes it possible to eliminate interference from other Simrad sonars on board the vessel. If the sonars are connected together, you can use these settings to synchronise their transmissions.

External Synchronisation dialog options

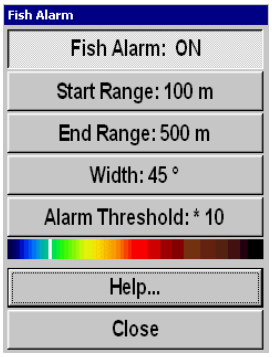
- **Sync mode**: Click to select one of the three synchronization modes below.
- Mode **None**: Click to disconnect the SH90 from the synchronisation system. The sonar will then operate completely on its own.
- Mode **Slave**: Click to connect the SH90 as a slave to an external system. The external system will then instruct the sonar when to transmit.
- Mode **Master**: Click to allow the SH90 to be in control. The sonar will then instruct the external system on when it can transmit.
- **Delay**: Click to select the delay between the SH90 transmission and the transmission of the external system, or vice versa. A dedicated dialog is provided to make the selection.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99

Fish Alarm

Dialog description



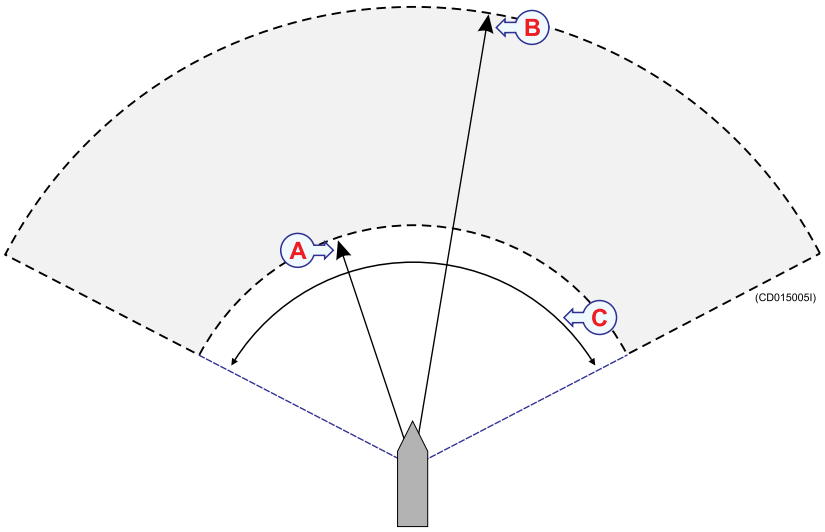
The **Fish Alarm** parameter dialog opens when you click the **Fish Alarm** button on the **Setup** menu.

This is an on/off switch used to activate or deactivate the fish alarm function. You can define an alarm area with inner and outer range radius and a chosen width, and select an alarm threshold. When fish is detected within the area, the alarm will be initiated. To mute the alarm, press the **Mute** button on the Operating Panel.

Fish Alarm dialog options

- **Start range**: Click to select the inner radius of the circular alarm sector. The start range can be between 0 and 7900 meters.
- **End range**: Click to select the outer radius of the circular alarm sector. The end range can be between 100 and 8000 meters.
- **Width**: Click to select the width of the alarm sector. The sector width can be set between 10 and 360 degrees.
- **Alarm Threshold**: Click to select the echo level for which the alarm shall be activated. The chosen echo level is shown with the white pointer in the echo colour bar just below the **Alarm Threshold** button.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Figure 34 Fish alarm properties



A *Start range*

B *End range*

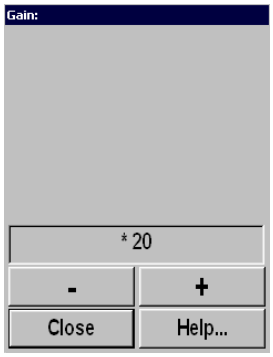
C *Width*

Related topics

- *Setup menu* on page 99

Gain

Dialog description



The **Gain** parameter dialog opens when you click the **Gain** button in the **Horizontal**, **Vertical** and **Vertical 180** menus.

The sonar gain is normally selected on the Operating Panel, but you can also do it with this function. It has 51 values, these are numbered from 0 to 50. The receiver gain is changed 1 dB per step. In addition to the read-out on the **Gain** button, the horizontal gain is normally repeated over the tilt indicator in the upper left hand corner on the display. The default value is 20 dB.

Gain dialog options

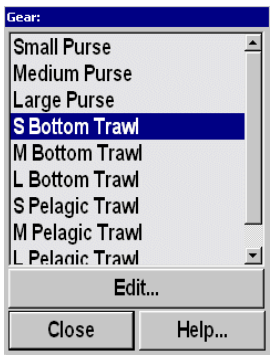
- + (plus): Click to increase the gain with 1 dB.
- – (minus): Click to decrease the gain with 1 dB.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *'Gain' field* on page 85
- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

Gear

Dialog description



The **Gear** parameter dialog opens when you click the **Gear** button in the **Setup** menu.

This dialog is used to select the type of fishing gear you use, and to get the right size and position of the gear on the sonar display. If you click the **Edit** button you can program the system for three different purse seines, three different bottom trawls, and three different pelagic trawls.

Gear dialog options

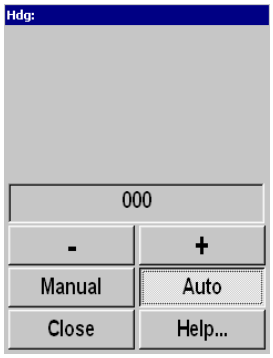
- **Purse**: Click to select small, medium or large purse.
- **Bottom Trawl**: Click to select small, medium or large bottom trawl.
- **Pelagic Trawl**: Click to select small, medium or large pelagic trawl.
- **Edit**: Click to open a dedicated parameter dialog to edit the parameters of the chosen gear.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Edit Gear (Purse)* on page 133
- *Edit Gear (Trawl)* on page 134

Heading

Dialog description



The **Heading** parameter dialog opens when you click the **Hdg** (Heading) button in the **Status** parameter dialog at the bottom of the menus.

The read-out of the current heading is a repetition of the connected course gyro input. This parameter dialog allows you to set a manual heading input if the signals from the external heading sensors are missing.

Note

This heading read-out must not be used for navigation.

Heading dialog options

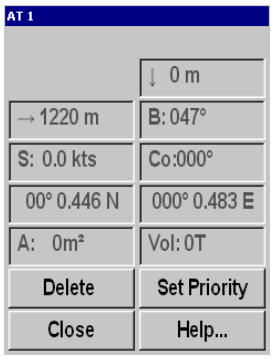
- + (plus): Click to increase the manual heading with 1 degree.
- – (minus): Click to decrease the manual heading with 1 degree.
- **Manual**: Click to allow manual heading. Use this option only if the ship's heading sensor is unavailable.
- **Auto**: Click to use automatic heading information from the ship's heading sensor.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99

Inspect Object

Dialog description



The **Inspect Object** parameter dialog is either opened when you select a target marker in the **Objects** menu, or when you place the cursor on the marker and pushes the **Select** button on the Operating Panel. You can also open this dialog directly from the **Object** pop-up menu when you have placed the cursor over the target.

This parameter dialog displays the current parameters for the chosen object. Note that every parameter may not be applicable for all marker categories.

For more information about the Operating Panel, see *'Cursor' field* on page 86.

Inspect Object dialog options

- **Depth**: This read-out shows the current depth of the chosen object.
- **Distance**: This read-out shows the current distance to the chosen object.
- **Bearing (B)**: This read-out shows the current bearing to the chosen object.
- **Speed (S)**: This read-out shows the current speed of the chosen object.
- **Course (CO)**: This read-out shows the current course of the chosen object.
- **Geographical Position**: This read-out shows the current geographical position of the chosen object.

- **Area (A)**: This read-out shows the estimated area of the chosen object.
- **Volume (V)**: This read-out shows the estimated volume of the chosen object.
- **Delete**: Click to delete the chosen object from the marker list.
- **Set Priority**: Click to change the current marker to the "priority" target. The marker is then identified with a "P".
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Objects menu* on page 101
- *Object pop-up menu* on page 109

Language

Dialog description

The **Language** parameter dialog opens when you click the **Language** button on the **Display** menu.

This parameter dialog is used to select the language on the menus. Click to select requested language.

Note

The on-line help may not be available in the language you choose to use. If this is the case, the default English on-line help will be used.

Language dialog options

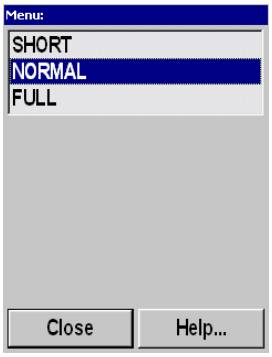
- **[Language]**: Click to select the menu language you prefer.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98

Menu

Dialog description



The **Menu** parameter dialog opens when you click the **Menu** button in the **Display** menu.

This parameter dialog allows you to select different levels of complexity in the menu system. Using this function you can hide menu buttons that you do not use.

Menu dialog options

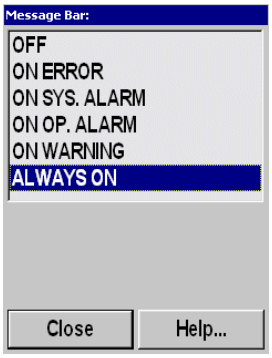
- **Short**: Click to see only the most important buttons in the menus. This setting is recommended for simplified use.
- **Normal**: Click to see the most common buttons in the menus. This setting is recommended for normal users.
- **Full**: Click to see all the buttons in the menus. This setting is recommended for advanced users.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98

Message Bar

Dialog description



The **Message Bar** parameter dialog opens when you click the **Message Bar** button in the **System Test** menu. The **System Test** menu is in turn opened by clicking the **Test** button on the **Setup** menu.

The sonar automatically issues messages when operational disturbances occur. The messages are grouped into four categories, and this parameter dialog is used to select at which level warnings and alarms shall be presented. Note that messages are also indicated with colours in the bottom field of the **Status** parameter dialog.

The **Message Bar** is located at the bottom of the display. It contains four buttons, one for each category of messages. These buttons give an overview of the number of unread messages currently in the system, and each of the four buttons gives access to a menu where each message can be read, acknowledged and deleted. When no messages are present, the four buttons are grey. When one or more unread messages exists, the **Warning** and **Operational Alarm** buttons are yellow, while the **System Alarm** and **Error** buttons are red.

Message Bar dialog options

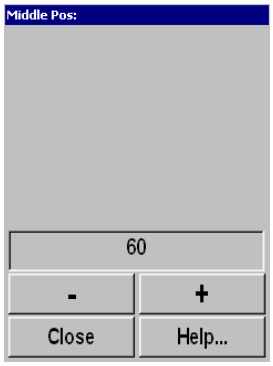
- **Off**: Click to switch off the **Message Bar**. It will not be shown, even if messages are issued.
- **On Error**: Click to allow the **Message Bar** to appear only when error messages are issued by the sonar.
- **On Sys.Alarms**: Click to allow the **Message Bar** to appear only when system alarms are issued by the sonar.
- **On Op.Alarms**: Click to allow the **Message Bar** to appear only when operational alarms are issued by the sonar.
- **On Warning**: Click to allow the **Message Bar** to appear only when warnings are issued by the sonar.
- **Always On**: Click to switch the **Message Bar** permanently on.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *System Test menu* on page 105

Middle Pos(ition)

Dialog description



The **Middle Pos(ition)** parameter dialog opens when you click the **Middle Pos** button in the **Transducer** parameter dialog.

This parameter dialog allows you to define a “middle” position for the transducer. Such a position may for example be the position where the transducer is located immediately below the trunk.

Middle Pos(ition) dialog options

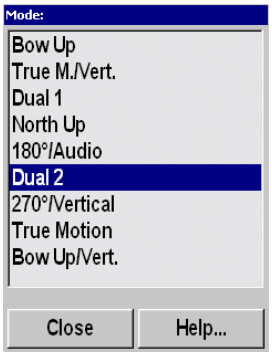
- + (plus): Click to increase the middle position.
- – (minus): Click to decrease the middle position.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Transducer* on page 169

Mode

Dialog description



The **Mode** parameter dialog opens when you click the **Mode** button on the top of all menus.

This parameter dialog is used to select display (presentation) mode. It will automatically provide a selection between the modes currently available on the sonar. Note that you can choose between the four tope modes using the **Mode** buttons on the Operating Panel.

The various display modes are described in the *Display Modes* chapter.

The modes can also be selected with the four **Mode** buttons on the Operating Panel. The various modes to activate using those buttons are controlled by the **Sort Modes** menu.

For more information about the **Mode** buttons on the Operating Panel, see *'Mode' field* on page 85.

Mode dialog options

- **[Mode]**: Click to select display mode.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display modes* on page 68
- *Sort Modes menu* on page 107
- *Mode Buttons* on page 145

Mode Buttons

Dialog description

The **Mode Buttons** button is located on the **Display** menu.

This is simply a selector switch. Click on the button to select *Mode* or *User*, and by this defining the operational function of the four **Mode** buttons on the Operating Panel.

For more information about the **Mode** buttons on the Operating Panel, see *'Mode' field* on page 85.

Mode Buttons options

- **Mode**: The four **Mode** buttons on the Operating Panel can be used to select from your favourite display modes.

  When the **Mode** buttons on the Operating Panel are used to select display modes, the four buttons will select the four top display modes in the same order as they appear in the **Sort Modes** menu.

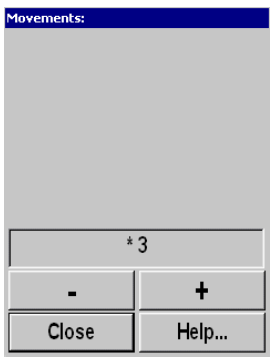
- **User**: The four **Mode** buttons on the Operating Panel can be used to select between four favourite user settings.

Related topics

- *Display menu* on page 98
- *Sort Modes menu* on page 107
- *Mode* on page 144

Movements

Dialog description



The **Movements** parameter dialog opens when you click the **Movements** button on the **Setup** menu.

This function makes it possible to estimate the position of a tracked school at a given time (from one to ten minutes). Estimated school position is presented by a violet dot. If you select 0, the movement estimation is switched off.

Movements dialog options

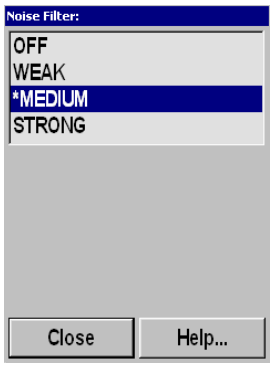
- + (plus): Click to increase the time.
- – (minus): Click to decrease the time.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *How to enable target track* on page 55
- *Setup menu* on page 99

Noise Filter

Dialog description



The **Noise Filter** parameter dialog opens when you click the **Noise Filter** button on the **Horizontal** menu.

This parameter dialog allows you to control the built-in filter designed to remove unwanted acoustic noise from the sonar picture. It will reduce the interference from other acoustic systems (sonars and echo sounders) on your own vessel and from other vessels in the vicinity. It will also suppress the noise from your own propellers and from other similar noise sources.

Noise Filter dialog options

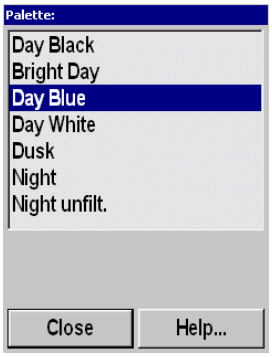
- **Off**: Click to switch the noise filter off.
- **Weak**: Click to switch the noise filter on, but only for weak filtering.
- **Medium**: Click to switch the noise filter on with medium strength.
- **Strong**: Click to switch the noise filter on with full strength.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Horizontal menu* on page 93

Palette

Dialog description



The **Palette** parameter dialog opens when you click the **Palette** button on the **Display** menu.

This parameter dialog allows you to select the background colours and day/night brightness of the display to suit you personal preferences. The choice you make here does not have any effect on the sonar performance.

Palette dialog options

- **[Palette]**: Click to choose the requested palette.

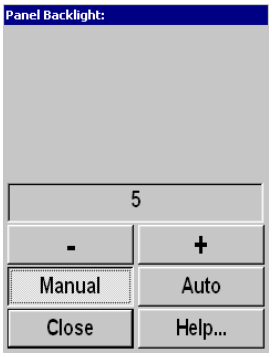
  The three top choices use the normal colour scale in the presentation, while the remaining four use the weak colour scale. If you decide to use any of these four palettes, you may find it useful to click the **Colours** button, and select **Strong**. This will make the presentation similar to the three top choices.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98
- *Colours* on page 127

Panel Backlight

Dialog description



The **Panel Backlight** parameter dialog opens when you click the **Panel Backlight** button on the **Display** menu.

This parameter dialog controls the background illumination on the keyboard on the Operating Panel in 8 steps (0 – 7). Note that the backlighting can only be manually operated. The **Auto** button is added for future expansion.

Panel Backlight dialog options

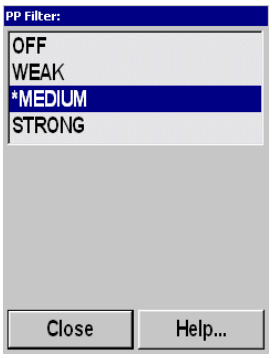
- + (plus): Click to increase the backlighting intensity.
- – (minus): Click to decrease the backlighting intensity.
- **Manual**: Click to allow manual control of the backlighting intensity.
- **Auto**: Not used.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98

PP Filter

Dialog description



The **PP Filter** parameter dialog opens when you click the **PP Filter** button on the **Horizontal**, **Vertical** and **Vertical 180** menus.

This filter reduces unwanted noise and echoes from the screen. The filter has three different strengths. As the ping-to-ping filter compares the echoes from the last two (weak), four (medium) or eight (strong) pings, it will take this selected amounts of pings to make a stable presentation when changing most of the sonar functions. The filtering routine takes the vessel's movements into consideration when comparing the echoes from ping to ping.

For more information, see also *What is the PP Filter?* on page 179.

PP Filter dialog options

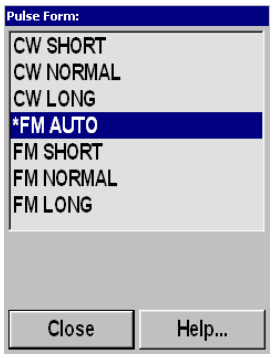
- **Off**: Click to switch the filter off.
- **Weak**: Click to switch on the filter to compare the echoes from the latest two pings.
- **Medium**: Click to switch on the filter to compare the echoes from the latest four pings.
- **Strong**: Click to switch on the filter to compare the echoes from the latest eight pings.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *What is the PP Filter?* on page 179
- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

Pulse Form

Dialog description



The **Pulse Form** parameter dialog opens when you click the **Pulse Form** button on the **Horizontal** and **Vertical** menus.

This parameter dialog is used to select the shape of the transmitter pulses. These can either be CW (Continuous Wave) with different pulse lengths, or FM (Frequency Modulation) with different pulse lengths and a continuous frequency sweep.

Pulse Form dialog options

- **CW[x]**: Click to select CW (Continuous Wave) with *Short*, *Normal* or *Long* pulse length.
- **FM Auto**: Click to select FM (Frequency Modulation) transmission and automatic selection of frequencies and pulse lengths depending on the current range.
- **FM[x]**: Click to select FM (Frequency Modulation) transmission with *Short*, *Normal* or *Long* pulse length.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Table 1 CW and FM pulse lengths (in milliseconds) for different ranges

Range	CW Short	CW Normal	CW Long	FM Auto	FM Short	FM Normal	FM Long
50	0,2	0,4	1,2	3	3	3	3
75	0,2	0,4	1,2	3	3	3	3
100	0,4	0,8	2,4	6	3	6	6
150	0,6	1,2	3,6	12	3	6	12
200	0,8	1,6	4,8	12	3	6	12
300	1,2	2,4	7,2	20	5	10	20
400	1,6	3,2	9,6	24	6	12	24
500	2,0	4	12	32	8	16	32
600	2,4	4,8	14,4	40	10	20	40
750	3	6	18	48	12	24	48
1000	4	8	24	60	15	30	60
1200	4,8	9,6	28,8	60	15	30	60
1500	6	12	36	60	15	30	60
2000	8	16	48	60	15	30	60

About CW (Continuous Wave)

The frequency of the transmitter pulse is here constant, and equal to the operational frequency.

You can select between three different pulse lengths; *Short*, *Normal* and *Long*. In addition, the pulse length will also change automatically in accordance with the selected range. The table above shows the different pulse lengths given in milliseconds (ms).

About FM (Frequency Modulation)

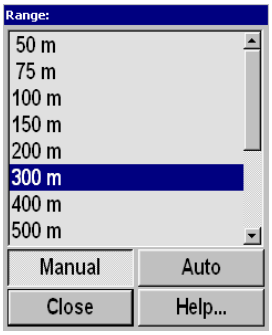
In the FM mode, the transmitter pulse is frequency modulated. This means that the frequency of the transmitted pulse changes during the transmission. The receiver undertakes a spectrum analysis to compare the received echoes with the transmitter's frequency code. This provides a stable echo presentation, and greater ability of detection as noise and reverberation are reduced.

Related topics

- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

Range

Dialog description



The **Range** parameter dialog opens when you click the **Range** button in the **Horizontal**, **Vertical** and **Vertical 180** menus.

Horizontal and vertical ranges are normally selected using the buttons on the Operating Panel. You can also control these settings directly using this parameter dialog. The available choices are listed in the dialog.
In addition to the read-out on the menu, the current horizontal range is normally displayed over the tilt indicator in the upper, left-hand corner of the display.

For more information about the range settings made on the Operating Panel, see *'Range' field* on page 86.

Range dialog options

- **[Range]**: Click to select manual range.

  Available ranges are 50, 75, 100, 150, 200, 300, 400, 500, 600, 750, 1000, 1200, 1500 and 2000 meters.
- **Manual**: Click to enable manual range selection.
- **Auto**: Click to enable automatic range selection during position- and target tracking. This allows for optimal tracking.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

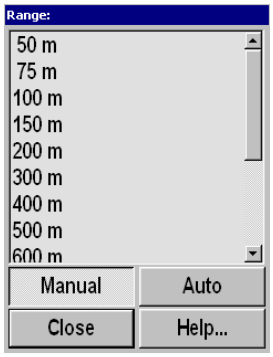
To maintain a steady display during seine setting, the lower automatic range is set to 450 meters. Changing the range or pressing the **Manual** button will stop the automatic ranging function. The sonar is designed to work with various horizontal range units such as meter, nautical mile, US survey feet or yards. This choice can be made by pressing the **Units** button in the **Display** menu.

Related topics

- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96
- *Units* on page 173

Range (CatchView)

Dialog description



The **Range (CatchView)** parameter dialog opens when you click the **Range** button in the **CatchView** menu.

The **CatchView** menu is in turn activated by pressing the **View** button on the Operating Panel (or the middle mouse button), while the cursor is located in the *Catch* view, and then selecting **View menu** on the **View** pop-up menu.

This parameter dialog is used to select the range in the *Catch* view. You can define the range manually, or select automatic setting. The CatchView range will then follow the range currently selected for the other vertical views.

Range (CatchView) dialog options

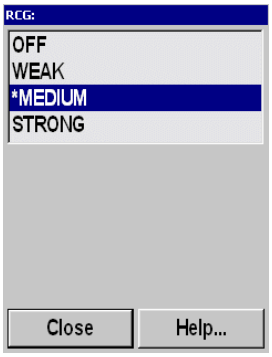
- **[Range]**: Click to select manual range.
- **Manual**: Click to enable manual range selection.
- **Auto**: Click to enable automatic range selection. The range will then follow the range currently selected for the other vertical views.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *CatchView menu* on page 113
- *Range* on page 151

RCG

Dialog description



The **RCG** (Reverberation Controlled Gain) parameter dialog opens when you click the **RCG** button in the **Horizontal**, **Vertical** and **Vertical 180** menus.

Reverberation Controlled Gain (RCG) regulates the receiver gain individually for each of the 64 receiving beams. If you select weak or medium filter strength, signals with small variations, like propeller noise, surface and bottom reverberations will be removed, while signals with fast variations, like target echoes or bottom echoes, will not be removed. If you select a strong filter, a special function removes the bottom, while echoes on the bottom will be presented.

Note

Scattered fish can be perceived as reverberation. The RCG function must therefore be used with care if scattered schools are to be detected.

RCG dialog options

- **Off**: Click to switch the filter off.
- **Weak**: Click to switch on a weak filter.
- **Medium**: Click to switch on a medium filter.
- **Strong**: Click to switch on the special filter to remove the bottom echoes.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *What is RCG?* on page 181
- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

Recall

Dialog description

The **Recall** button is located on the **Store/Recall** menu, which in turn is opened from the **Setup** menu.

The **Recall** button is used to retrieve the previously stored display information. You can select which storage image you wish to see by selecting it from the list of temporary or permanent files, or start a playback sequence. When a playback sequence is finished, the last picture of the sequence will remain "frozen" on the display. The recalled image is clearly identified with the word "Recall".

- To exit the recall mode, press the **Object button** on the Operating Panel or the right mouse button.
- To control the recall function, click the **Recall Mode** button on the **Store/Recall** menu.
- To record sonar images, press the **Record** button on the Operating Panel, or click the **Store** button in the **Store/Recall** menu. To define the recording mode, click the **Store Mode** button in the **Store/Recall** menu

Related topics

- *Storage procedures* on page 48
- *Setup menu* on page 99
- *Store/Recall menu* on page 104
- *Recall Mode* on page 154
- *Store* on page 163
- *Store Mode* on page 164

Recall Mode

Dialog description

The **Recall Mode** parameter dialog opens when you click the **Recall Mode** button in the **Store/Recall** menu. The **Store/Recall** menu is in turn opened by pressing the **Store/Recall** button on the **Setup** menu.

This parameter dialog is used to select the replay function of the **Recall** button in the **Store/Recall** menu.

To record sonar images, press the **Record** button on the Operating Panel, or click the **Store** button in the **Store/Recall** menu. To define the recording mode, click the **Store Mode** button in the **Store/Recall** menu

Recall Mode dialog options

- **Single shot**: Click to recall one single screen shot.
- **Each 2 s**: Click to recall a sequence of stored display images. The recalled image will be updated once every two seconds.
- **Each 5s**: Click to recall a sequence of stored display images. The recalled image will be updated once every fifth second.
- **Each 10th s**: Click to recall a sequence of stored display images. The recalled image will be updated once every ten seconds.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Storage procedures* on page 48
- *Setup menu* on page 99
- *Store/Recall menu* on page 104
- *Recall* on page 154
- *Store* on page 163
- *Store Mode* on page 164

Ruler

Dialog description

The **Ruler** parameter dialog opens when you position the cursor on top of a ruler, and then press the **Select** button on the Operating Panel (or the left mouse button).

This dialog provides information about the currently selected ruler, its length and angle. The same information is also provided next to the ruler on the display.

To create a ruler, open the **Object** pop-up menu by pressing the **Object** button on the Operating Panel (or the right mouse button), and select **New ruler** in the **Object** pop-up menu.

Ruler dialog options

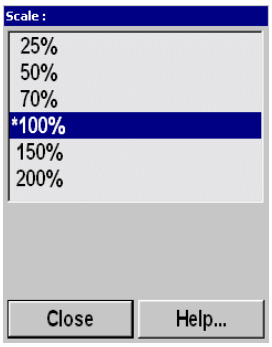
- **Length (L)**: This read-out provides the length of the ruler.
- **Direction (Di)**: This read-out provides the direction of the ruler in degrees.
- **Delete**: Click to delete the currently selected ruler.
- **Set Priority**: Not used.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Object pop-up menu* on page 109

Scale

Dialog description



The **Scale** parameter dialog opens when you click the **Scale** button in the **GeoView** menu.

The **GeoView** menu is activated by pressing the **View** button on the Operating Panel (or the middle mouse button) in any horizontal view, and then selecting **View menu** in the **View** pop-up menu.

This dialog allows you to scale the horizontal presentations up or down.

Scale dialog options

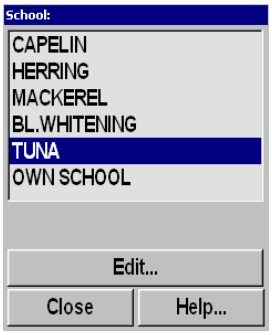
- **[Scale]**: Click to choose the preferred scale.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *GeoView menu* on page 111
- *View pop-up menu* on page 108

School Data

Dialog description



The **School Data** parameter dialog opens when you click the **School** button in the **Setup** menu.

This parameter dialog is used to obtain information of the volume estimation of a school in the automatic target tracking program. Five types of known fish species plus “own school” can be selected. Assumed density can be adjusted according to experience by use of the **Edit School** button.

School Data dialog options

1 **[Species]**: Click to choose the preferred species.

2 **Edit**: Click to open the **Edit School** parameter dialog, which allows you to change the density of the chosen species.

3 **Close**: Click to close the parameter dialog.

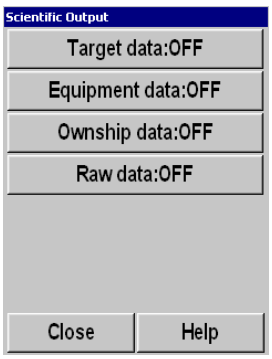
4 **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Edit School* on page 135

Scientific Output

Dialog description



The **Scientific Output** parameter dialog opens when you click the **Scientific Output** button in the **Setup** menu.

Note

The Scientific Output function is optional.

The **Scientific Output** function is designed to be used when the sonar is used for scientific purposes. When enabled, the sonar will export special information on a dedicated Ethernet port. This parameter dialog allows you to specify the data formats.

Scientific Output dialog options

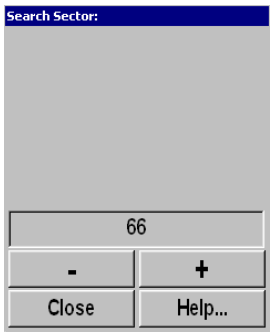
- **Target Data**: Click to enable or disable export of target data. These consist of all the actual target track data for all targets which are in automatic target track mode.
- **Equipment Data**: Click to enable or disable export of equipment data. These consist of all gear parameter data for the selected gear, both data which are manually selected, and data which are automatically transferred from the Simrad ITI trawl system or the Simrad PI Series catch monitoring system.
- **Ownship Data**: Click to enable or disable export of own ship data. These consist of the vessel's position, speed and heading.
- **Raw Data**: Click to enable or disable export of raw data. These consist of the start ping telegram, the actual beam data, and the end of ping data.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99

Search Sector

Dialog description



The **Search Sector** parameter dialog opens when you click the **Search Sector** button in the **Bearing** parameter dialog. The **Bearing** parameter dialog opens when you click the **Bearing** button in the **Horizontal** menu.

This parameter dialog is used to define the size (in degrees) of the search sector, in which the audio beam will travel back and forth when the *Auto Search* mode is enabled.

Search Sector dialog options

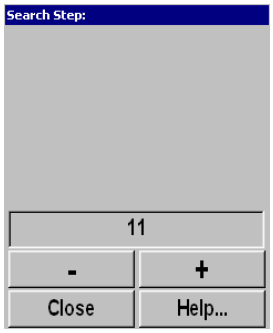
- + (plus): Click to increase the search sector.
- – (minus): Click to decrease the search sector.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Bearing (Horizontal)* on page 125
- *Search Step* on page 159

Search Step

Dialog description



The **Search Step** parameter dialog opens when you click the **Search Step** button in the **Bearing** parameter dialog. The **Bearing** parameter dialog opens when you click the **Bearing** button in the **Horizontal** menu.

This parameter dialog is used to define the size of each step (in degrees) the audio beam will travel between each transmission. This function is used when the *Auto Search* mode is enabled.

Search Step dialog options

- + (plus): Click to increase the step size.
- – (minus): Click to decrease the step size.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Bearing (Horizontal)* on page 125
- *Search Sector* on page 158

Slant Range

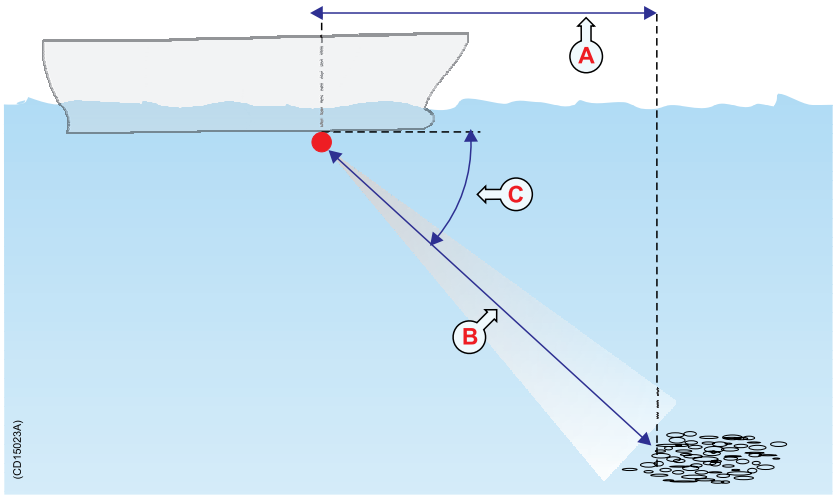
Dialog description

The **Slant Range** button is located in the **Cosmetics** menu, which in turn is opened from the **Display** menu.

This is a toggle switch which allows you to choose between *Slant Range* and *True Range*.

- **True Range**: This is the distance which the vessel must sail in order to come on top of the target.
- **Slant Range**: This is the distance to the target measured along the tilt angle.

Figure 35 True range (A), slant range (B) and tilt angle (C)

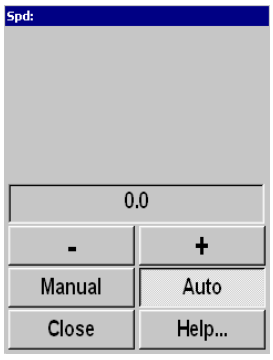


Related topics

- *Cosmetics menu* on page 103
- *True Range* on page 172

Speed

Dialog description



The **Speed** parameter dialog opens when you click the **Spd** (Speed) button in the **Status** parameter dialog at the bottom of the menus.

The speed read-out is a repetition of the connected speed input source, which can be a separate speed log input or data from the connected (D)GPS. In case of a fault in the speed data, the speed can be set manually by clicking **Manual** and using the + and - buttons to alter the speed value.

Speed dialog options

- + (plus): Click to increase the manual speed.
- – (minus): Click to decrease the manual speed.
- **Manual**: Click to allow manual speed entry.
- **Auto**: Click to allow automatic reception of speed data from a relevant external sensor.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Status* on page 162

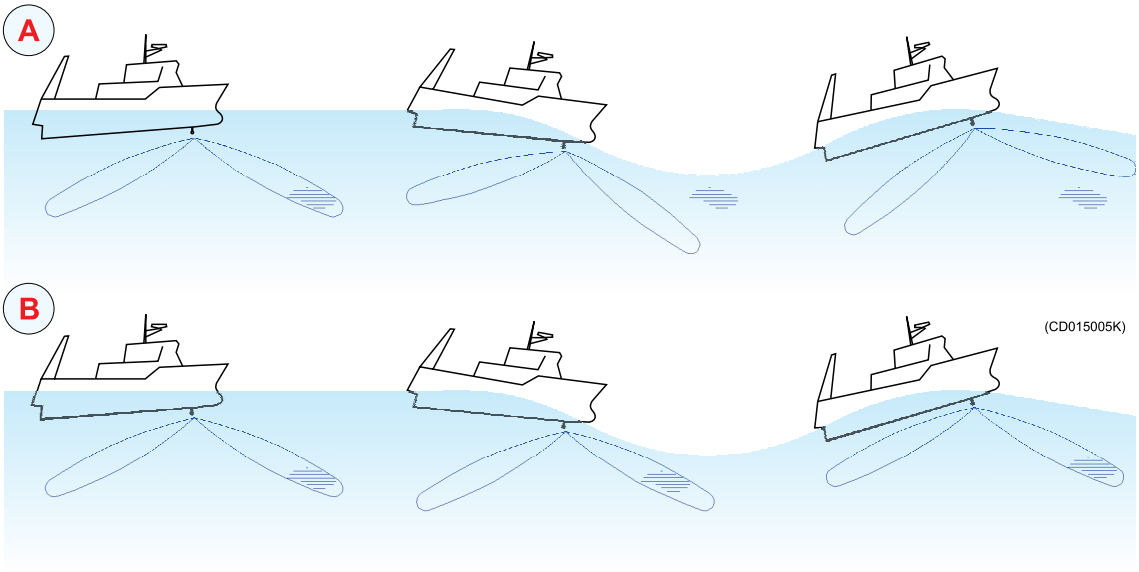
Stabilizer

Dialog description

The **Stabilizer** button is located in the **Setup** menu.

When the stabilizer is active, the transducer beam will be stabilized electronically for roll and pitch. The beam direction will change continuously according to the vessel's movements, and thus be compensated whenever the vessel is out of trim. The beam angle will always be maintained as if referred to a "flat" water surface. When the stabilizer is used, this will also allow you to use the PP Filter in rough seas. This filter will give a cleaner and more stable echo presentation.

Figure 36 Stabilisation principle



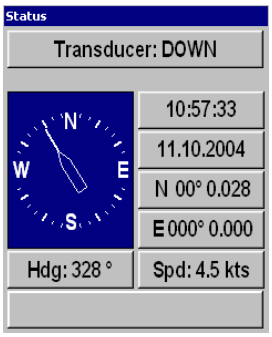
The first example in the figure (A) indicates the sonar beam without stabilisation, while the bottom vessel (B) indicates the stable sonar beam with the stabilisation in operation.

Related topics

- *Setup menu* on page 99

Status

Dialog description



The **Status** parameter dialog is by default displayed in the lower, right hand corner of the screen. The **Status** parameter dialog can not be closed, but if an other dialog is opened it will place itself on top.

The **Status** parameter dialog contains a transducer position indicator, as well as presentation of current time, date, latitude, longitude, heading and speed. Some of the buttons allow you to adjust the parameters.

Status dialog options

- **Transducer**: Click to access the **Transducer** parameter dialog for manual control of the hull unit.

  To operate the hull unit (lowering the transducer), see *Transducer* on page 169.

- **[Compass]**: Presentation of current heading.
- **[Time]**: Presentation of local time.

  Click to open the **Date and time properties** dialog box, which allows you to change the date and time settings. See *Date and time properties* on page 129.
- **[Date]**: Presentation of local date.

  Click to open the **Date and time properties** dialog box, which allows you to change the date and time settings. See *Date and time properties* on page 129.
- **[Position N]**: Presentation of current geographical position.
- **[Position E]**: Presentation of current geographical position.
- **Hdg**: Presentation of current vessel heading in a numerical value.

  Click to enter manual heading. See *Heading* on page 139.

  Note

  This heading read-out must not be used for navigation.
- **Spd**: Presentation of current vessel speed.

  Click to enter manual speed. See *Speed* on page 160.
- **[Message]**: Presentation of current messages. The button changes colour to reflect the importance of the message.

  Click the button to acknowledge. For additional details about the message, open the **Message Bar**. See *Message Bar* on page 142.

Related topics

- *Transducer* on page 169
- *Date and time properties* on page 129
- *Heading* on page 139
- *Speed* on page 160
- *Message Bar* on page 142

Store

Dialog description

The **Store** button is located on the **Store/Recall** menu, which in turn is opened from the **Setup** menu.

The **Store** button is used to store display information. This may be a sequence loop or single display pictures, as selected in the **Store mode** dialog.

If a sequence loop storage is selected, the **Store** button is used for start and stop of the storage. If single picture storage is selected, a new picture storage is made each time the **Store** button is pressed.

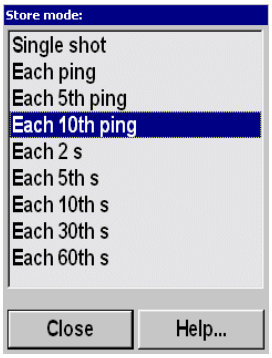
- To control the store function, click the **Store Mode** button on the **Store/Recall** menu.
- To recall (playback) sonar images, click the **Recall** button in the **Store/Recall** menu. To define the playback mode, click the **Recall Mode** button in the **Store/Recall** menu.

Related topics

- *Store/Recall menu* on page 104
- *Setup menu* on page 99
- *Store Mode* on page 164
- *Recall* on page 154
- *Recall Mode* on page 154

Store Mode

Dialog description



The **Store Mode** parameter dialog opens when you click the **Store Mode** button in the **Store/Recall** menu. The **Store/Recall** menu is in turn opened by pressing the **Store/Recall** button on the **Setup** menu.

This parameter dialog is used to select the storage function of the **Record** button on the Operating Panel and the **Store** button in the **Store/Recall** menu. The storage can be selected to contain single shots, or different ping- or time sequences.

To recall (playback) sonar images, click the **Recall** button in the **Store/Recall** menu. To define the playback mode, click the **Recall Mode** button in the **Store/Recall** menu.

Store Mode dialog options

- **Single shot**: Click to record one single screen shot.
- **Each ping**: Click to record the echoes from each ping in a series of separate images.
- **Each 5th ping**: Click to record the echoes from each fifth ping in a series of separate images.
- **Each 10th ping**: Click to record the echoes from each tenth ping in a series of separate images.
- **Each 2 s**: Click to record the sonar echoes every two seconds in a series of separate images.

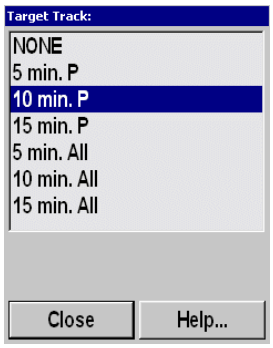
- **Each 5th s**: Click to record the sonar echoes once every fifth second in a series of separate images.
- **Each 10th s**: Click to record the sonar echoes once every tenth second in a series of separate images.
- **Each 30th s**: Click to record the sonar echoes once every half minute in a series of separate images.
- **Each 60th s**: Click to record the sonar echoes once every minute in a series of separate images.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99
- *Store/Recall menu* on page 104
- *Store* on page 163
- *Recall* on page 154
- *Recall Mode* on page 154

Target Track

Dialog description



The **Target Track** parameter dialog opens when you click the **Target Track** button in the **GeoView** menu.

The **GeoView** menu is in turn activated by pressing the **View** button on the Operating Panel (or the middle mouse button) in any horizontal view, and then selecting **View menu** in the **View** pop-up menu.

Target track lines show the movement history of targets as a line after the respective symbols. They are shown as straight line segments drawn between each position fix, with optional minute markers to be added for each minute along the line. You can switch the track line(s) off, or enable them for the priority target only (P), or for all targets.

Target Track dialog options

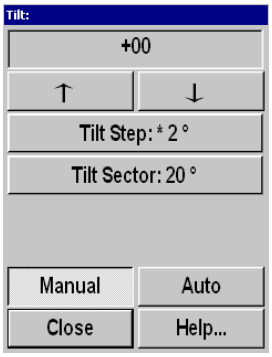
- **None**: Click to remove all target track lines.
- **[x] min.P**: Click to enable a target track line on the priority target.
- **[x] min.All**: Click to enable a target track line on all targets.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *GeoView menu* on page 111

Tilt

Dialog description



The **Tilt** parameter dialog opens when you click the **Tilt** button on the **Horizontal** menu.

This parameter dialog allows you to manually control the angle of the tilt. It also allows you to control the step and the sector the sonar shall tilt when operating in *Auto tilt* mode. The tilt is normally controlled from the Operating Panel. The transducer can be tilted electronically from +10 degrees up to -60 degrees down. In addition to the read-out on the **Tilt** button, the tilt angle is normally repeated on the tilt indicator in the upper left corner of the display, and in the vertical modes; directly in the vertical slice.

The **Tilt** buttons and the *Auto tilt* programs are described in the *Operating Panel* chapter. See *'Tilt' field* on page 89.

Tilt dialog options

- ↑ ↓: Click to tilt one degree up or down.
- **Tilt Step**: Click on either side of the button to control the tilt steps in *Auto tilt* mode. Click on the middle to open a dedicated parameter dialog to define the tilt step.
- **Tilt Sector**: Click on either side of the button to control the tilt sector in *Auto tilt* mode. Click on the middle to open a dedicated parameter dialog to define the tilt sector.
- **Manual**: Click to enable manual tilt mode. In this mode, you can tilt the transducer within its limits by clicking the two arrow buttons.

- **Auto**: Click to enable *Auto tilt* mode.

  In this mode, the transducer will automatically change tilt angle for each transmission. The change of the tilt angle is selected by the **Tilt Step** button, and the total tilt sector is selected by the **Tilt Sector** button. The centre of the auto tilt search can be adjusted with the **-** (tilt down) or + (tilt up) buttons on the Operating Panel. The tilt sector limits will be shown on the tilt indicator with yellow lines and digits.

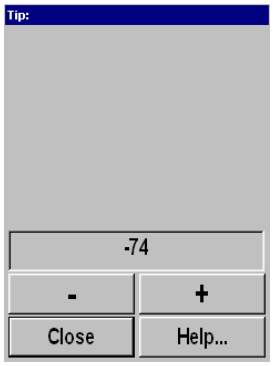
  Note that the auto tilt is working differently when one of the automatic training programs are activated (*Auto search*, *Position track* or *Target track*).
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Horizontal menu* on page 93

Tip

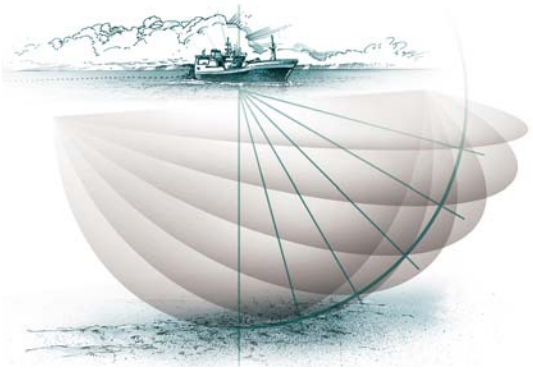
Dialog description



The **Tip** parameter dialog opens when you click the **Tip** button on the **Vertical 180** menu. This menu is only available in *Bow up/180° Vertical* mode.

As the cylindrical transducer has a “blind zone” straight down, an echo presentation in this direction will be limited to two approximately 60 degrees sectors. To avoid this “blind zone”, the vertical slice is made “tippable”, and by selecting a -60 degrees tip angle (or less), a full 180 degrees coverage is obtained. The tip angle can be adjusted from +10 to -90 degrees. In addition to the presentation in this dialog and on the **Tip** button, the selected tip angle is also shown with a dotted yellow line in the tilt indicator in the upper left corner.

Figure 37 The Tip principle



Tip dialog options

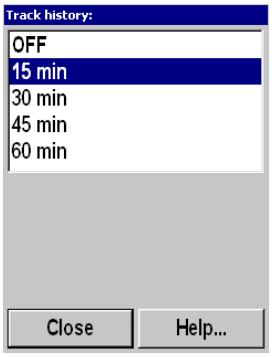
- + (plus): Click to increase the tip angle.
- – (minus): Click to decrease the tip angle.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Vertical 180 menu* on page 96

Track History

Dialog description



The **Track History** parameter dialog opens when you click the **Track History** button on the **Cosmetics** menu.

The track history lines show the movement history of your own ship as a line after the vessel symbol. When this function is active, the length (in time) of the history lines can be set. It is also possible to place minute markers on the history line. To activate this, click the **Minute Marker** button on the **Cosmetics** menu. These markers are shown as small circles on the history line.

Track History dialog options

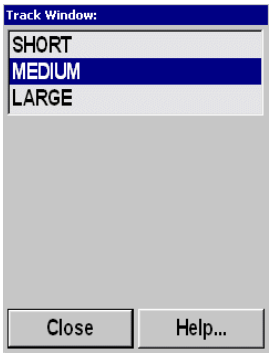
- **Off**: Click to disable the track history.
- **[x] min**: Click to enable the track history line with length [x] minutes.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Cosmetics menu* on page 103

Track Window

Dialog description



The **Track Window** parameter dialog opens when you click the **Track Window** button on the **Setup** menu.

This parameter dialog enables you to adjust the track window size. A larger track window will enable the system to track a large target more easily, but the system will be more susceptible to background noise. Smaller targets may be ignored if there is a lot of noise in the area, as the system will track the strongest echo within the track window.

Track Window dialog options

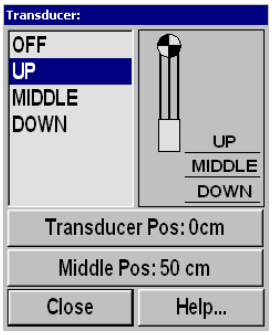
- **Short**: Click to use a small track window.
- **Medium**: Click to use a medium sized track window.
- **Large**: Click to use a large track window.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99

Transducer

Dialog description



The **Transducer** parameter dialog opens when you click the **Transducer** button in the **Status** parameter dialog.

The transducer position is normally selected from the Operating Panel, and in addition to the LED indicators on the panel, the transducer position is shown in the **Status** parameter dialog. The buttons in this parameter dialog correspond to their respective buttons on the Operating Panel, and allows you to control the transducer position by means of the sonar's menu system.

Transducer dialog options

- **Off**: Click to switch off the sonar system.
- **Up**: Click to retract the transducer to its upper position.
- **Middle**: Click to position the transducer in its middle position. This position is defined by means of the **Middle Pos** button.

- **Transducer Pos(ition)**: This is a read-out (in centimetres) of the transducer's current position.
- **Middle Pos(ition)**: This is the defined middle position (in centimetres) of the transducer. To change the position, click the button.
- **Down**: Click to lower the transducer to its bottom position.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

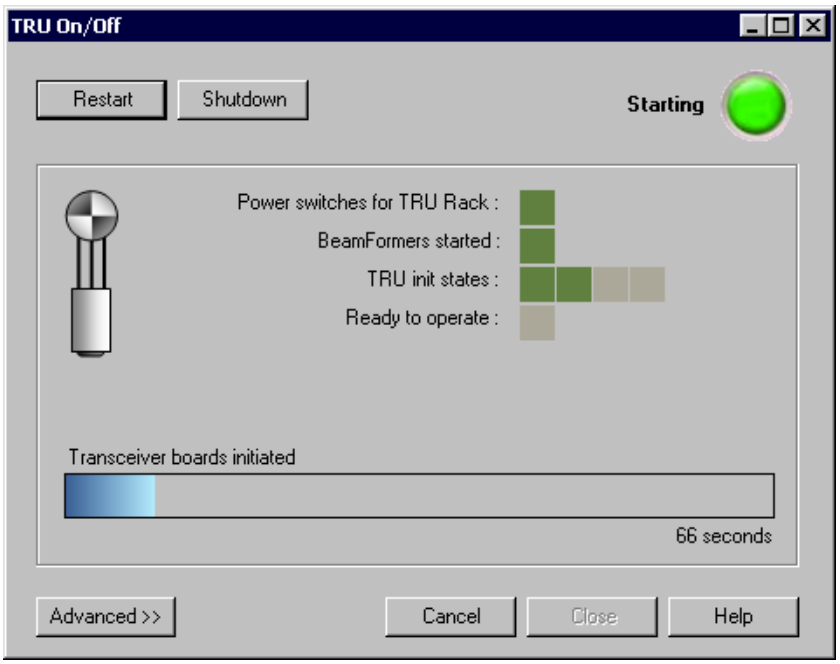
Related topics

- *Status* on page 162
- *Middle Pos(ition)* on page 143

TRU On/Off

The **TRU On/Off** dialog opens automatically when you switch the sonar on or off. It will also appear when you click the **TRU On/Off** button on the **System Test** menu.

Figure 38 System start-up in progress



This dialog is used to monitor the progress when the sonar system is switched on or off. The various stages in the progress is indicated with the rectangular green "lamps", while the blue progress bar shows the overall progress. The circular lamp in the top right corner is an indicator that shows if the Transceiver Unit is presently starting (green) or stopping (red).

The sonar will start up even if circuit boards in the Transceiver Unit is malfunctioning. The sonar will then need more time to perform the start-up procedure, and a short message will be provided above the progress bar: *System ready for ping, but with reduced number of TRH32* . After the sonar has started up, the **TRU On/Off** dialog can be opened by clicking the **TRU On/Off** button on the **Test** menu. Click the **Advanced** button to obtain more information.

Buttons

- **Restart**: Click to restart the Transceiver Unit.
- **Shutdown**: Click to switch off the Transceiver Unit.
- **Advanced**: Click to enlarge the dialog to show additional information.
- **Close**: Click to close the dialog.

Advanced features

- **Hull Unit Position**: Select the hull unit position.
- **Transceivers**: This button opens a separate dialog to access a list of the available transceivers. This feature is intended for software debugging and maintenance. Do not use!
- **Debug**: This text field displays the progress using text messages. It is provided for debugging purposes. This feature is intended for software debugging and maintenance. Do not use!
- **Errors**: This text field displays errors using text messages. It is provided for debugging purposes. This feature is intended for software debugging and maintenance.
- **BeamFormers OFF**: Click this button to switch off the beamformer functions. This feature is intended for software debugging and maintenance. Do not use!
- **TRX Powers ON/OFF**: Click this button to switch on and off the power supplies in the Transceiver Unit. This feature is intended for software debugging and maintenance. Do not use!

These advanced features are not intended for end users. If you attempt to change any of the settings provided, your sonar may become unserviceable.

Related topics

- *System Test menu* on page 105
- *Power on/off procedures* on page 38

True Range

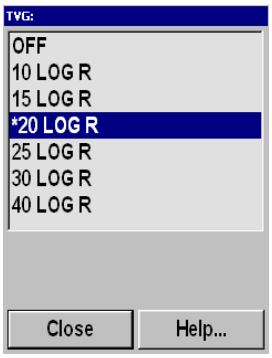
The **True Range** button is located in the **Cosmetics** menu, which in turn is opened from the **Display** menu. Refer to *Slant Range* on page 159 for further information.

Related topics

- *Cosmetics menu* on page 103
- *Slant Range* on page 159

TVG

Dialog description



The **TVG** (Time Variable Gain) parameter dialog opens when you click the **TVG** button in the **Horizontal**, **Vertical** and **Vertical 180** menus.

The TVG (Time Variable Gain) controls the gain in the signal amplifier. The gain is weakest just after the ping, and increases in accordance with time (and therefore range). The TVG can be selected with six different curve slopes, each having different gain regulations. The **Auto** option is marked with an asterisk to indicate the theoretically correct setting for the different range settings. With this setting, the gain is adjusted in such way that a school of fish with a certain size and density will be presented with approximately the same strength on the screen in any position inside the regulated TVG range.

TVG dialog options

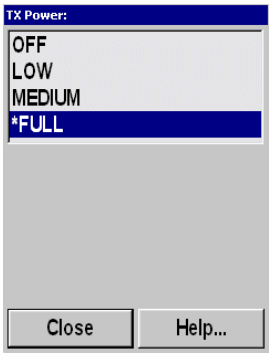
- **Off**: Click to switch the TVG off.
- **[x] LOG R**: Click to select TVG function.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *What is TVG?* on page 178
- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

TX Power

Dialog description



The **TX Power** parameter dialog opens when you click the **TX Power** button in the **Horizontal**, **Vertical** and **Vertical 180** menus.

This parameter dialog is used to select the transmitter output power. Note that this setting is common for all the menus. Thus, if the power is changed in one menu, it will automatically also be changed in all other menus. The transmitter operates with four different power settings.

TX Power dialog options

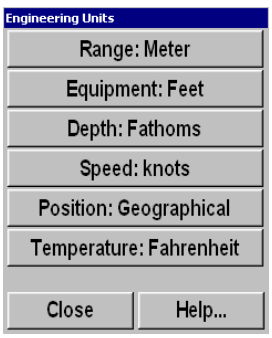
- **Off**: Click to switch the transmission power off. The sonar will operate in passive mode
- **Low**: Click to select low output power.
- **Medium**: Click to select medium output power.
- **Full**: Click to select full output power.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Horizontal menu* on page 93
- *Vertical menu* on page 95
- *Vertical 180 menu* on page 96

Units

Dialog description



The **Engineering Units** parameter dialog opens when you click the **Units** button in the **Display** menu.

This parameter dialog is used to set up the various units used by the sonar to display all measurements. Separate units are available for range, equipment, depth, speed, position and temperature. When any of these buttons are pressed, dedicated parameter dialogs are provided to make the selection.

Engineering Units dialog options

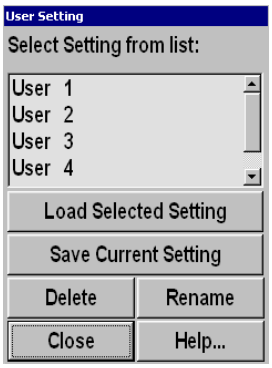
- **Range**: Click to change unit for range. Select Meters, Nautical mile, Feet or Yards.
- **Equipment**: Click to change unit for equipment. Select Meter, Fathoms or Feet.
- **Depth**: Click to change unit for depth. Select Meters, Fathoms or Feet.
- **Speed**: Click to change unit for speed. Select Meters/Second (m/s), Knots or Kilometres/Hour (km/h).
- **Position**: Click to view unit for geographical position.
- **Temperature**: Click to change unit for temperature. Select Celsius or Fahrenheit.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Display menu* on page 98

User Setting

Dialog description



The **User Setting** parameter dialog opens when you click the **User Setting** button in the **Setup** menu.

This parameter dialog is used to store the parameter settings for different type of fisheries, or individual user related settings. The stored settings can easily be loaded back into the operative menus using the **Mode** buttons on the Operating Panel.

For more information about the **Mode** buttons on the Operating Panel, see *'Mode' field* on page 85.

User Setting dialog options

- **Load Selected Setting**: Use this option to retrieve the previously stored setting. Click on the chosen setting in the dialog to highlight it, and then click this button to retrieve it.

- **Save Current Settings**: Use this option to save all the currently used parameter settings. You will always save your current setting as a "new user". By default the setting will be named *User N*, and "N" is simply the next available number.

  Note

  *In principles you can use any name, but the **Mode** buttons on the Operating Panel will only choose from User 1, User 2, User 3 and User 4. These names must also be on the top of the list. If you wish to add users, apply names like for example "User 5 Charlie".*

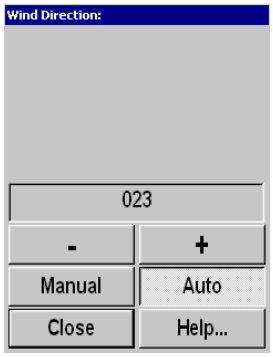
- **Delete**: Click to select one of the settings in the list, then click this button to delete it.
- **Rename**: This option provides an on-screen keyboard to rename the stored user setting. Click on a setting to select it, then click this button. Enter the new name using the on-screen keyboard.
- **Select users**: By means of the four **Mode** buttons on the Operating Panel you can select the four top users on the list. The list of users is sorted alphabetically, and you can rename the users and thus control which **Mode** button to recall which user.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *User setting procedures* on page 57
- *Setup menu* on page 99

Wind Direction

Dialog description



The **Wind Direction** parameter dialog opens when you click the **Wind Direction** button in the **Setup** menu.

The wind marker is shown as a white arrow in the outer area of the echo presentation. This arrow can be manually adjusted for indication of the wind or current direction, or automatically show the wind direction if a wind sensor is connected.

Wind Direction dialog options

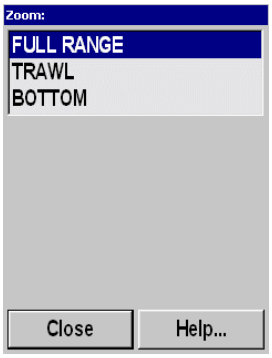
- + (plus): Click to increase the wind direction.
- – (minus): Click to decrease wind direction.
- **Manual**: Click to enable manual setting of the wind direction.
- **Auto**: Click to enable automatic setting of the wind direction. The information must then be provided from an external sensor connected to the sonar.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *Setup menu* on page 99

Zoom

Dialog description



The **Zoom** parameter dialog opens when you click the **Zoom** button in the **VerticalView** menu.

The zoom function is used to zoom in on the vertical view around the trawl symbol or the bottom. To zoom in on the bottom, an external echo sounder must be connected to the sonar.

Zoom dialog options

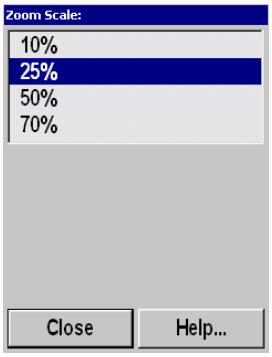
- **Full Range**: Click to use the full range in the vertical presentation.
- **Trawl**: Click to zoom in on the trawl.
- **Bottom**: Click to zoom in on the bottom.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *VerticalView menu* on page 112

Zoom Scale

Dialog description



The **Zoom** parameter dialog opens when you click the **Zoom** button in the **VerticalView** menu.

This parameter dialog is used for scaling the zoom around the bottom.

Zoom Scale dialog options

- **[x] %**: Click to select zoom scale.
- **Close**: Click to close the parameter dialog.
- **Help**: Click to access the on-line help.

Related topics

- *VerticalView menu* on page 112

BASIC THEORY

This chapter explains some of the basic theory related to settings, error sources and noise conditions.

Topics

- *Settings* on page 178
- *Noise and reverberation* on page 182
- *Layers and deflections* on page 185

Settings

A sonar will transmit a sound wave into the water around the vessel. When this sound wave hits fish, bottom, or other objects in the water, a part of the sound will be returned as echoes. These echoes are collected by the sonar, interpreted by the sonar computers, and presented on the display.

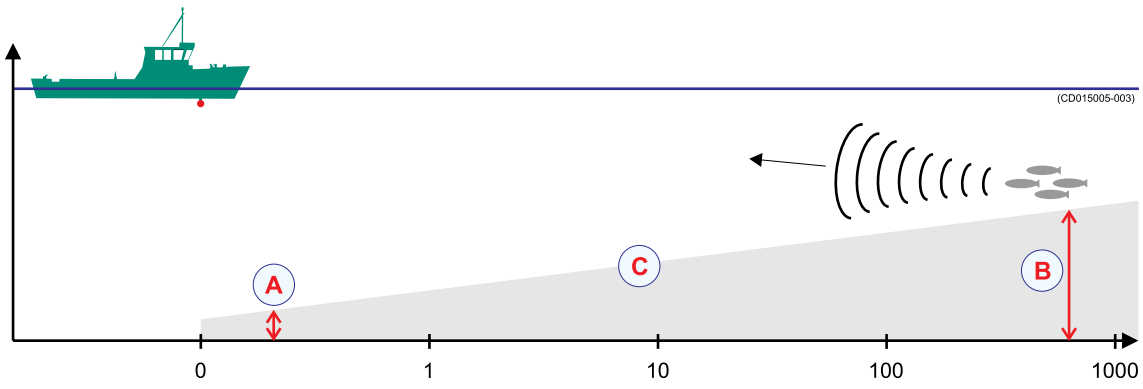
The most important interpretation is however left to you, and it may often be difficult to distinguish the echoes and identify targets. In order to help you with this, the SH90 sonar provides numerous advanced filter and gain functions. You can also tilt the sonar beam vertically in order to achieve an optimum result, and you can use the vertical slice to view “across” into the water.

This chapter provides you with some basic theory about some of the key settings available.

What is TVG?

TVG means *Time Varied Gain*. As echoes will be weaker when the distance to them increase, the sonar will automatically amplify distant echoes more than close echoes. In practice, the gain will increase in proportion with how long the sonar must wait for the echoes.

Figure 39 The TVG principle: The gain at time (B) is larger than at time (A)



When you choose the TVG setting you can either switch it off, or choose a **"X log R"** value. The different settings determine how much gain the sonar will use as time elapses along the X-axis. A higher value for "X" will make the angle (C) steeper.

What is AGC?

AGC means *Automatic Gain Control*. The AGC will automatically scale the received echo data to maintain a proper dynamic range based on all the incoming echo values. In addition to *Off*, the strength of the filter can be set to three different levels.

What is the PP Filter?

PP Filter means *Ping-to-Ping filter*. When this function is activated, the sonar will compare the echoes from one ping with the echoes from the next pings. If an echo is present at the first ping, but then disappears at the next, the sonar will interpret this as noise and reverberation, and suppress it.

If you choose setting **Weak**, the sonar will only compare two consecutive pings. If you choose settings **Medium** or **Strong** the sonar will compare four and eight pings respectively.

About pulse form and length

On the SH90 sonar, you can transmit sound modulated as

- FM
- CW

FM means *frequency modulated*, which means that the frequency of the transmitted pulse is changed during the transmission. In most cases this method will provide better echo presentation and stability, and you will avoid excessive noise and reverberation.

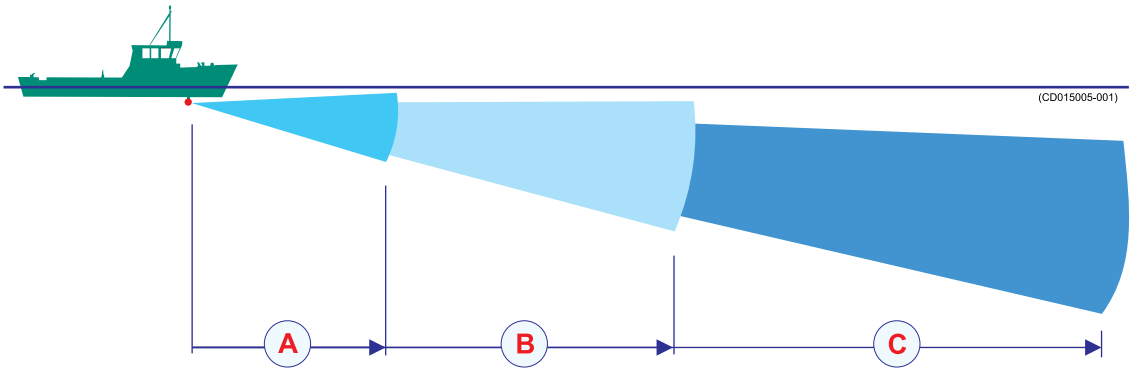
CW means *continuous wave*, which means that the transmission frequency is fixed during the entire pulse. When you use CW transmission you can choose the length of the pulses. In a search phase under good conditions, you should try setting **Long**. If the conditions worsen, try to shorten the pulse length. This will make it easier to distinguish the various echoes, and the reverberation will be reduced.

The default setting on the SH90 sonar is **FM Auto**. In this transmission mode, the sonar will automatically choose the optimal pulse length for the current range.

About beam widths

A narrow beam will always reach further than a wide beam. This is because the transmitted power of the sonar is concentrated. Nevertheless, you can easily “miss” a school of fish if you make the beam too narrow. If the range is reduced, it is the common to use a wider beam.

Figure 40 Beam widths



A *Large*

B *Normal*

C *Narrow*

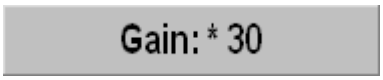
The normal setting on the SH90 sonar is **Normal**. This setting is basically designed for longer ranges.

You may also try setting **Auto**. This setting will automatically adjust the beam width depending on the current range.

For more information, see the parameter dialog description; *Beam* on page 123.

About Gain

You can adjust the gain in many different ways, but the most important is the setting made by the **Gain** buttons on the Operating Panel and on the **Horizontal** and **Vertical** menus.



If you have too much gain, you will see a sonar picture with too many echoes. This is because the large amplification presents all kind of noise and reverberation that the sonar picks up. If the gain is smaller the noise and reverberation will disappear, but if it the gain is too small the fish echoes may disappear as well. In most cases you should try with a medium value.

On this sonar, you can adjust the horizontal and vertical gain independent of each other. The horizontal gain is used when the sonar operates in a horizontal mode, for example *Bow up* or *True motion*. If you switch to a mode with a vertical view, for example *True motion/Vertical*, your sonar will need a different gain setting for the beams directed towards the bottom.

To adjust the gain, see *How to adjust the gain* on page 41.

What is RCG?

RCG means *Reverberation Controlled Gain*. This is a two-dimensional filtering of the received echoes in order to suppress unwanted surface and bottom reverberation.

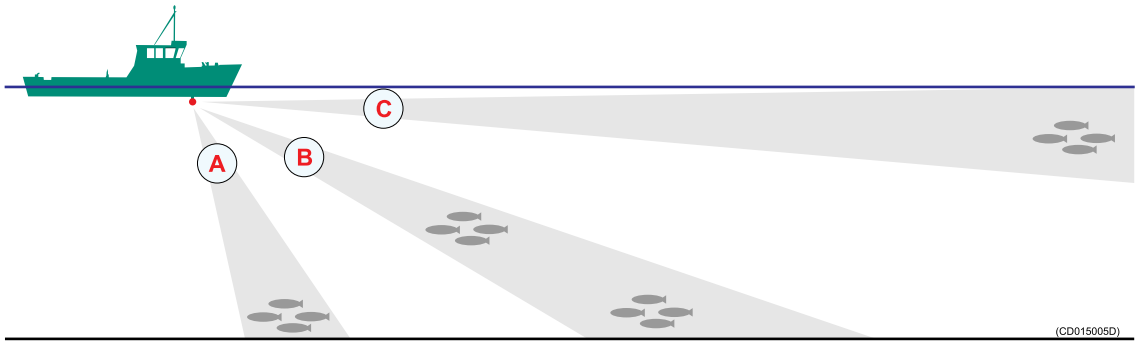
If you select *Strong*, the bottom echoes will disappear altogether if the bottom is flat, while schools of fish close to the bottom will be easier to see.

Note that scattered fish may be more difficult to spot if the RCG function is active, as these can be misinterpreted as reverberation. It is therefore important that you use the RCG with great care if your are searching for scattered fish.

About tilt

The sonar beam can be tilted vertically in steps of 1 degree, and the chosen tilt is shown on the sonar picture. At 0 degrees tilt you will transmit the sonar beam in parallel with the sea surface, while 60 degrees tilt will direct it almost straight down.

Figure 41 Tilt



The challenge will always be to find a tilt that prevents the fish echoes to be buried in reverberation and bottom echoes.

If you use a high tilt value (A) the fish will easily be disguised by the bottom echoes, but a strong RCG setting will help. As the distance from the bottom to the fish increases, the fish will

be easier to see when the RCG removes the bottom echoes. However, this assumes that the fish echoes are considerably stronger than the bottom echoes.

If you use a very small tilt (C) you will not be bothered by bottom echoes. If the sea surface is gusty, you will however easily see echoes from the waves. These echoes will normally be rather weak, and will hardly move in relation to your vessel.

By means of a medium tilt angle (B) you will most likely be able to pick up scattered fish or schools if these are located at some distance above the bottom. The upper school in the illustration will appear on the sonar picture before the bottom echo, while the lower school will easily be disguised by the bottom echoes. Once again you can activate the RCG function to improve the reading.

Noise and reverberation

Every time you use the sonar the quality of your search operations will depend on numerous error sources caused by the natural environment and physical properties of your vessel. We distinguish between the two terms *noise* and *reverberation*.

- *Noise* is generated by the vessel: engine, propellers, winches, refrigerating plants etc.
- *Reverberation* is caused by natural conditions in the sea: temperature, salinity, sea state and bottom conditions.

The most common cause of acoustic noise is the propeller and the cavitation caused by its rotation. Other typical noise sources on board your vessels are winches, refrigerating plants, power generators, pumps and cranes. If you experience problems you think are caused by noise, try to find out which system that causes the noise, and contact your dealer for advice.

Cavitation

As the propeller blades move through the water, low pressure areas are formed as the water accelerates around and moves past the blades. The faster the blades move, the lower the pressure around it will become. As it reaches vapour pressure, the water vaporizes and forms small bubbles of gas. This is cavitation.

Figure 42 Cavitation [1]

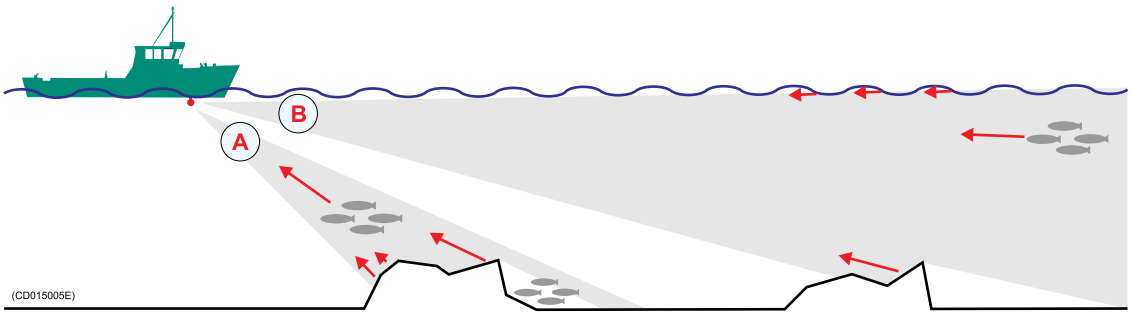
When the bubbles collapse, they cause very strong local shock-waves in the water. These may be audible and can also damage the propeller blades. In addition to this, the cavitation will generate very strong reverberation, commonly seen as a red stripe of echoes behind the vessel.

If you have big problems with cavitation, try to adjust the propeller pitch and/or the number of revolutions.

Reverberation

Reverberation is generated when the echoes from your sonar transmission are reflected not only by fish and objects in the water, but also from the bottom and the sea surface.

Figure 43 Reverberation



1. Photo from US Navy/Wikipedia in the public domain.

The echoes from the bottom will vary with how uneven the bottom is, what kind of bottom you have under your vessel, (rock, mud, sand etc.) as well as your current tilt setting. The echo from the sea surface will vary with the current sea state and your current tilt setting.

The illustration demonstrates how the bottom and the sea surface return echoes back to your sonar transducer. In situation (A) you will see several weak echoes from the waves and from the rock on the bottom, you will still be able to identify the school of fish. In situation (B) you will be able to identify the upper school of fish, but the lower school will be hidden in the shadow of the rock.

Be aware of that other vessels close to you will also generate reverberation due to the water disturbance caused by the wake, the propellers and the cooling water spill.

Blocking

The movement of your vessel through the water will often – especially in higher sea states – cause air bubbles to be generated, and these bubbles will move along the hull. This is called blocking. In order to prevent this noise from disturbing your sonar operations, it is important to lower the sonar transducer as far down below the hull as possible.

Check the noise yourself!

If you are bothered with acoustic or electric noise, you can easily run a few simple tests to identify the cause of the problem.

How to check the acoustic noise

This procedure provides a simple method to check the acoustic noise.

1. Click the **Setup** tab to open the menu.
2. Click the **Test** button to open the **System test** menu.
3. Click the **Test config** button, and select **Noise and VR** in the parameter dialog.
4. Click the **Close** button in the parameter dialog to close it.
5. Observe the **Echo level** button on the **System test** menu.
6. Read the noise level.

   The level your read in the button is the current noise in the direction of the cursor. The noise is provided in dB, and the number should be as small as possible.

   In order to reduce the noise, try to adjust the propeller pitch and the number of revolutions.

How to check for electrical noise

This procedure provides a simple method to check the electrical noise.

1 Switch off all electric equipment that can cause electrical noise.

   This includes motor, propellers, thrusters, winches, cooling- and air conditioning systems, pumps, cranes, hydraulic systems etc.

2 Switch the equipment on again one at the time, and check the sonar every time.

   With luck, you will spot which of your electrical systems that create the noise. To deal with the problem, consult your dealer and/or a certified ships electrician.

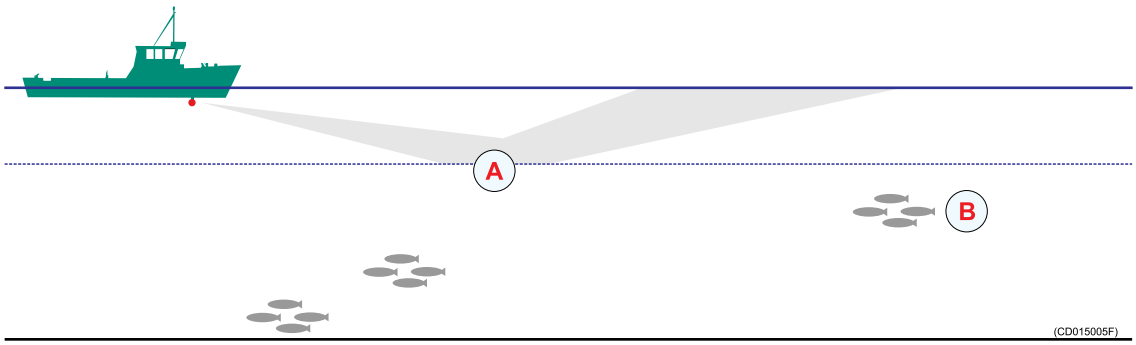
Layers and deflections

Your sonar operations may also be disturbed by environmental situations that you are unable to control. Two typical conditions are temperature and salinity layers, and deflections caused by increasing or decreasing water temperature.

Temperature and salinity layers

You may experience that temperature and/or salinity layers exist in the water column. Since the speed of sound in water depends on its temperature and salinity, such layers will cause the sound beam to be reflected.

Figure 44 Temperature and salinity layers

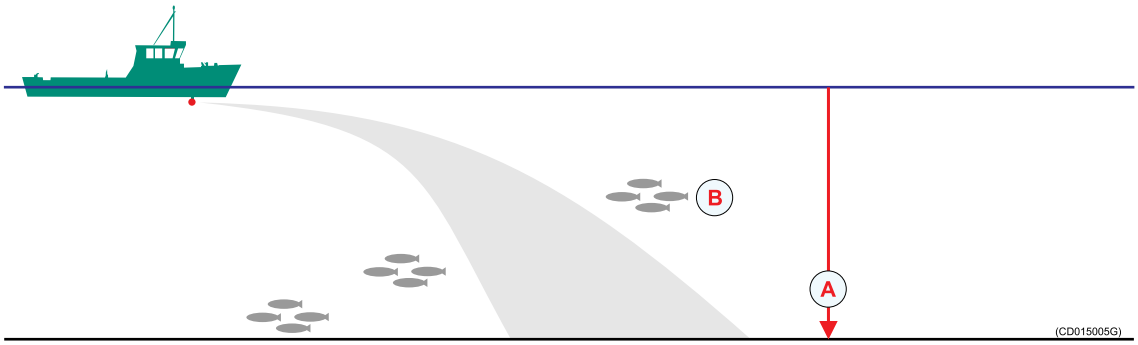


If you transmit a sonar beam down towards a temperature or salinity layer (A), it may be reflected as indicated in the illustration. The school of fish (B) you thought you would see will not be visible at all.

Deflections

On warm days – especially during summer – the sea surface will be heated by the sun, and the water temperature will gradually decrease with increasing depth.

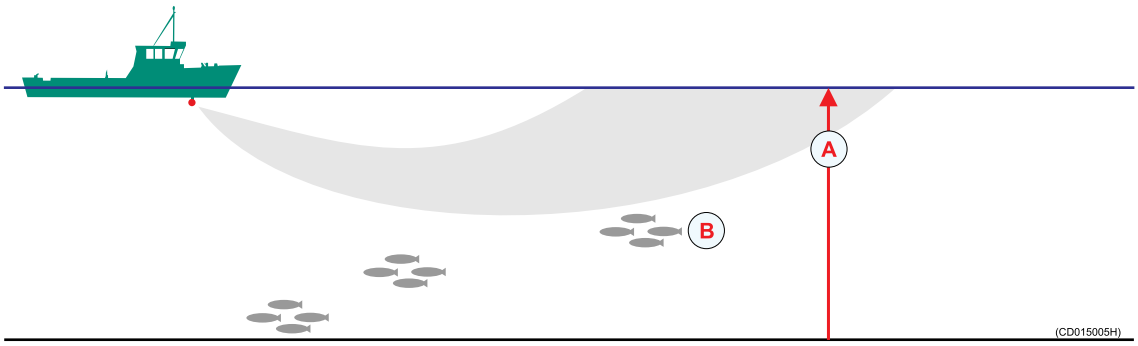
Figure 45 Water temperatures on warm days



When the temperature decreases (A) closer to the bottom, the sonar beam is deflected down as indicated by the illustration. The school of fish (B) you thought you would see is not visible at all.

On cold days, you may experience the opposite: the cold water will be close to the surface, and the water temperature increases with increasing depth.

Figure 46 Water temperatures on cold days



When the temperature decreases (A) closer to the surface, the sonar beam is deflected up as indicated by the illustration. The school of fish (B) you thought you would see is once again not visible at all, and you will also see a ring of surface echoes.

ON-BOARD MAINTENANCE

This chapter deals with maintenance work that you may carry out on board. In addition to cleaning the cabinets and dust filters, you should inspect the sonar room at least once a week. The ventilation and heating system, as well as the bilge pump arrangement should then be checked to be in good working order. For location and replacing of fuses, refer to the chapter for the unit in question. Major repairs and complete overhaul of the sonar should be left to an authorized Simrad service engineer.

Topics

- *Preventive maintenance schedule* on page 188
- *Wheelhouse units on-board maintenance* on page 190
- *Transceiver Unit on-board maintenance* on page 191
- *Power Supply Unit maintenance* on page 193
- *Hull Unit maintenance* on page 194

Preventive maintenance schedule

The Simrad SH90 is a state of the art sonar system with only a minimum of moving parts. At the same time, the sonar system hardly provides any user serviceable parts. In order to secure the system for long and trouble-free use, observe the following preventive maintenance tasks.

Regular or monthly basis

Observe the following tasks to be carried out on a regular basis, and at least every month.

1 Clean the screen on the colour display.

→ *Display cleaning* on page 190

2 Check the ambient temperature and the humidity in the sonar room.

→ *Ambient temperature and humidity* on page 191

3 Clean the Transceiver Unit.

→ *Transceiver Unit cleaning* on page 191

4 Clean the Power Supply Unit.

→ *Power Supply Unit cleaning* on page 193

5 Check that the Transceiver Unit is dry, and not exposed to excessive dust or vibrations.

→ *Transceiver Unit cleaning* on page 191

6 Inspect the hull unit to check for water penetration due to lack of lubricant. Lubricate if required.

→ *Hull unit lubrication* on page 207

Every three months

Observe the following tasks to be carried out every three months.

1 Clean the Processor Unit surfaces.

→ *Processor Unit cleaning* on page 190.

2 Clean the Operating Panel surfaces.

→ *Operating Panel cleaning* on page 190

3 If you have a Heat Exchanger on your Transceiver Unit, clean its internal filters and fans.

→ *Transceiver Unit Heat Exchanger* on page 192

When in dry dock

Observe the following tasks to be carried out when the vessel is in dry dock.

1 Inspect the transducer.

2 Clean and remove marine growth.

→ *Cleaning the transducer* on page 204

After dry docking

Observe the following tasks to be carried out once the vessel has left the dry dock.

1 Perform a functional test of the hull unit.

→ *Docking the vessel* on page 202

2 Check the air bleeding system.

→ *Air bleeding* on page 206

Whenever required

Observe the following tasks to be carried out whenever required.

1 Lubricate the hull unit.

→ *Hull unit lubrication* on page 207

Wheelhouse units on-board maintenance

Observe the following on-board maintenance instructions for the units installed in the wheelhouse.

Colour display on-board maintenance

Observe the following on-board maintenance instructions for the colour display. For detailed maintenance instructions, observe the information provided in the display documentation.

Display cleaning

1 Ensure that the colour display is kept clean and dry.

2 Remove dust and salt water residue with a soft cloth moistened in fresh water. Do not use strong solvents.

Note

The display screen must be handled with care to avoid damage to the anti-glare filter coating.

Dedicated cleaning chemicals for CRT and LCD displays are provided by office suppliers.

Processor Unit on-board maintenance

Observe the following on-board maintenance instructions for the Processor Unit.

Processor Unit cleaning

1 Ensure that the Processor Unit is kept clean and dry.

2 Remove dust and salt water residue with a soft cloth moistened in fresh water. Do not use strong solvents.

Serviceable parts

There are no user serviceable parts inside the Processor Unit.

Operating Panel on-board maintenance

Observe the following on-board maintenance instructions for the Operating Panel.

Operating Panel cleaning

1 Ensure that the Operating Panel is kept clean and dry.

2 Remove dust and salt water residue with a soft cloth moistened in fresh water. Do not use strong solvents.

Serviceable parts

There are no user serviceable parts inside the Operating Panel.

Transceiver Unit on-board maintenance

Observe the following on-board maintenance instructions for the Transceiver Unit.

Ambient temperature and humidity

It is important that the sonar room is kept dry. The Transceiver Unit must not be exposed to excessive dust and humidity, as this can cause corrosive attacks and subsequent failures to the electronic circuitry. Visit the sonar room at regular intervals to check temperature and humidity, and take the necessary actions if the environmental conditions are poor.

Transceiver Unit cleaning

The Transceiver Unit must be kept clean and dry.

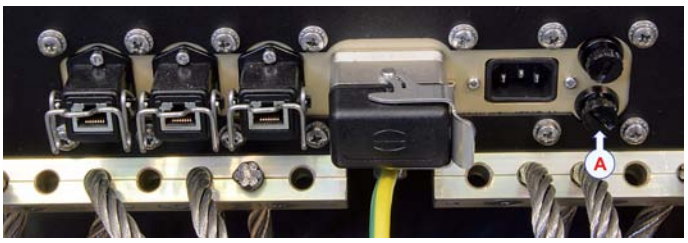
1 Remove dust and salt water residue with a soft cloth moistened in fresh water. Do not use strong solvents.

2 Check that the Transceiver Unit is not exposed to excessive dust and vibrations.

Transceiver Unit fuses

The Transceiver Unit is provided with the following fuses.

Figure 47 Location of Transceiver Unit fuses



A Locations of **F1** and **F2** under the Transceiver Unit cabinet.

The Transceiver Unit is fused with two fuses. Both are located under the cabinet next to the AC mains socket. The fuses are:

- **F1**: 3,15 A, Slow blow, 5 x 20 mm
- **F2**: 3,15 A, Slow blow, 5 x 20 mm

Transceiver Unit Heat Exchanger

As an option, the Transceiver Unit may be provided with a Heat Exchanger. The filters and fans in this Heat Exchanger must be cleaned. This procedure explains how to do that.

Note

The Heat Exchanger is an optional item. If it is not mounted on your Transceiver Unit, disregard this procedure.

1 Open the front panel on the Heat Exchanger by removing the four bolts indicated on the illustrations.

Figure 48 Heat Exchanger front panel mounting bolts (A) removal

2 Use a vacuum cleaner with a plastic or rubber nozzle, as well as soft cloth moistened in fresh water, to clean the interior.

3 Remount the front panel.

Transceiver Unit serviceable parts

There are no user serviceable parts inside the Transceiver Unit.

Power Supply Unit maintenance

Observe the following on-board maintenance instructions for the Transceiver Unit.

Power Supply Unit cleaning

The Power Supply Unit must be kept clean and dry.

1 Remove dust and salt water residue with a soft cloth moistened in fresh water. Do not use strong solvents.

2 Check that the Power Supply Unit is not exposed to excessive dust and vibrations.

Power Supply Unit serviceable parts

There are no user serviceable parts inside the Power Supply Unit.

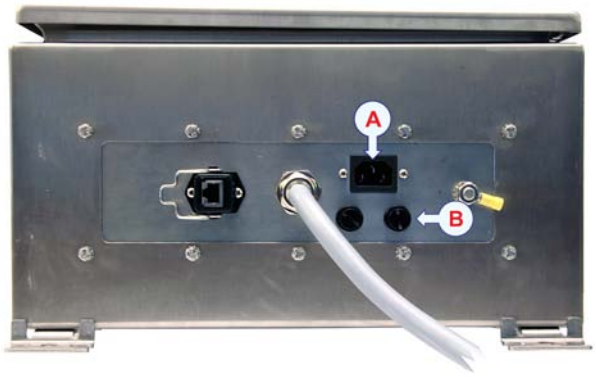
Power Supply Unit fuses

The Power Supply Unit is provided with the following fuses:

- **F1**: 6,3 A, Slow blow, 5 x 20 mm
- **F2**: 6,3 A, Slow blow, 5 x 20 mm

Both fuses are located under the Power Supply Unit cabinet.

Figure 49 Location of Power Supply Unit fuses



A *AC mains input*

B *Fuses*

Hull Unit maintenance

Observe the following on-board maintenance instructions for the Hull Unit.

Note

The Hull Unit must be under continuous watch as a part of the vessel machinery.

In addition to lubrication, check for signs of corrosion. If required, clean the corroded areas, and paint over with a high quality protective paint.

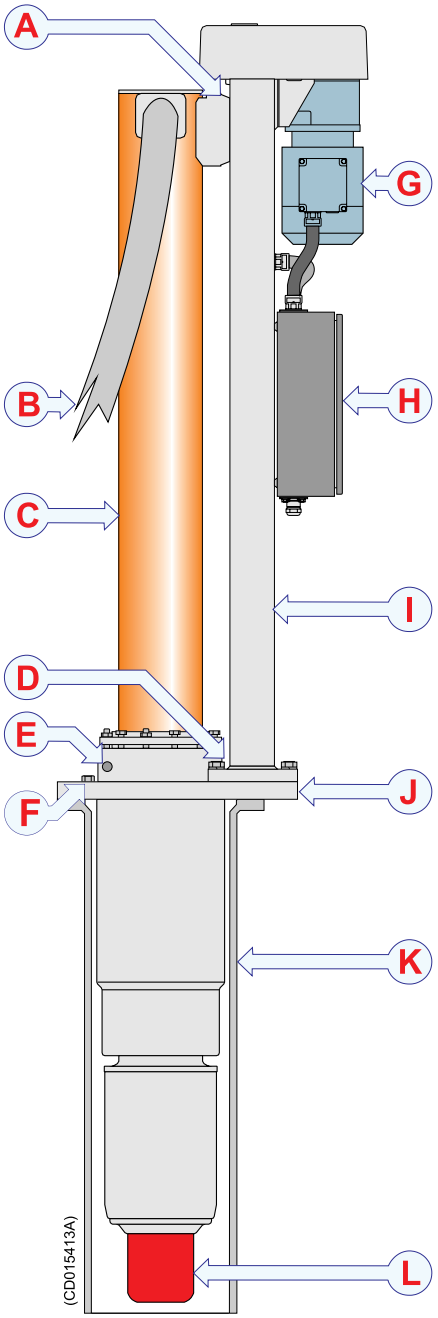
As it may be exposed to severe strain because of pitching and vibrations, the hull unit must be checked at regular intervals for loose bolts and parts.

Topics

- *Hull unit familiarization* on page 195
- *Motor Control Unit familiarization* on page 196
- *Fuses in the Motor Control Unit* on page 197
- *Hoisting and lowering from the sonar room* on page 198
- *Motor protecting switch (S301)* on page 202
- *Docking the vessel* on page 202
- *Cleaning the transducer* on page 204
- *Air bleeding* on page 206
- *Hull unit lubrication* on page 207

Hull unit familiarization

Figure 50 Hull unit familiarization



A *Upper limit switch S304*

B *Transducer cable*

C *Transducer shaft*

D *Lower limit switch S305*

E *Grease nipple (Pressure release plug on rear side)*

F *Air bleeding plug*

G *hoisting motor*

H *Motor Control Unit*

I *Hoisting unit*

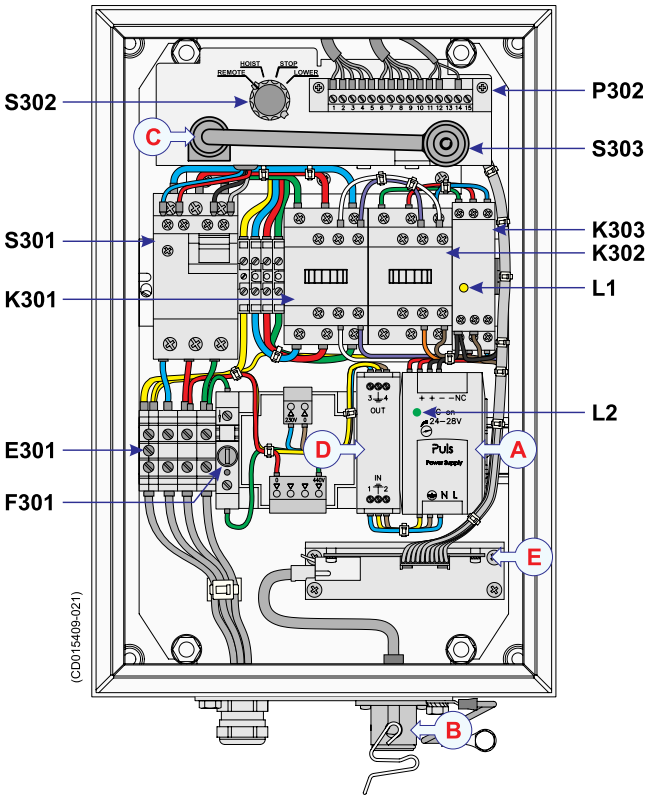
J *Mounting flange*

K *Installation trunk*

L *Transducer*

Motor Control Unit familiarization

Figure 51 Motor Control Unit familiarization



During normal operational conditions, the following two indicator lamps shall be lit:

- **L1** indicates that the phase watch relay **K303** is activated. This mean that the 3-phase voltage is applied to the hoist/lower system, and that the three phases are correctly connected with regard to the training direction of the hoisting motor.
- **L2** indicates that the internal +24 Vdc power supply for the control electronic is operational.

A *Internal 24 Vdc power supply*

B *Ethernet connector*

C *Hand crank*

D *Mains filter*

E *Hull Unit Controller circuit board*

F301 *Fuse for internal power supply*

E301 *Terminal strip for AC mains input*

K301 *Hoisting contactor*

K302 *Lowering contactor*

K303 *Phase watch relay*

L1 *Yellow indicator light*

L2 *Green indicator light*

S301 *Motor protecting switch*

S302 *Hoist/lower switch*

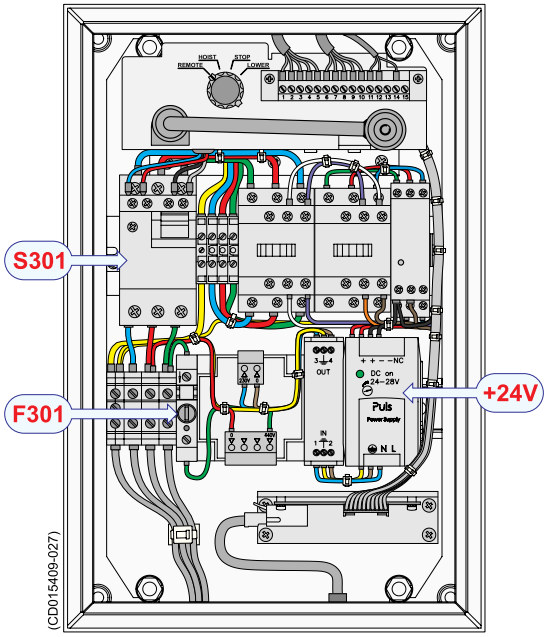
S303 *Hand crank with safety switch*

P302 *Connector for hull unit limit switches and rotation sensor*

Fuses in the Motor Control Unit

The Hull Unit is fused with two types of fuses located in the Motor Control Unit.

Figure 52 Location of S301, F301 and +24 Vdc power supply



Motor Protecting Switch S301

To prevent the hoisting motor from overload, the 3-phase voltage for the motor is fused with the current adjustable Motor Protecting Switch **S301**. This switch is located inside the Motor Control Unit.

The motor protecting switch will automatically disable hoisting and lowering, if:

- the vessel's speed is too high
- the transducer shaft has been bent
- the lubrication reservoir on the Hull Unit is empty

In such case, a failure warning will be presented on the sonar display. After the cause of the failure has been fixed, the protecting switch is reset by pressing the operating handle upwards to position **ON**. For service purposes, this operating handle can be pressed downwards to position **OFF** to prevent unexpected operation while servicing the Hull Unit.

Fuse F301

The Motor Control Unit contains an internal +24 Vdc power supply for the control electronic. This power supply is powered from two phases of the 3-phase voltage, and is fused with **F301** which is a 500 mA Slow Blow type. The fuse is located on the right-hand side on the 3-phase terminal **E301**.

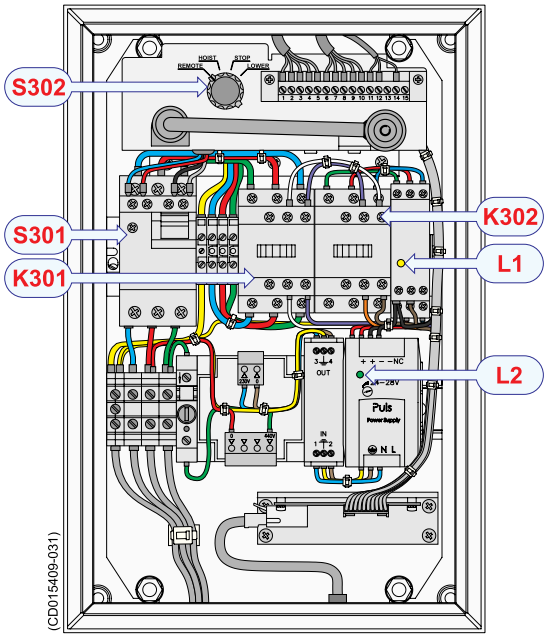
Hoisting and lowering from the sonar room

In case of failure in the normal hoist/lower operation controlled from the Operating Panel, or for maintenance purposes, the transducer may be hoisted and lowered from the sonar room. Three different procedures may be used.

In the event of improper operation, the powerful 3 kW electric motor may cause serious damage to the equipment and/or injury to personnel.

Therefore, before you start the operation, read carefully through the relevant procedure(s). You will then familiarize yourself with the method .

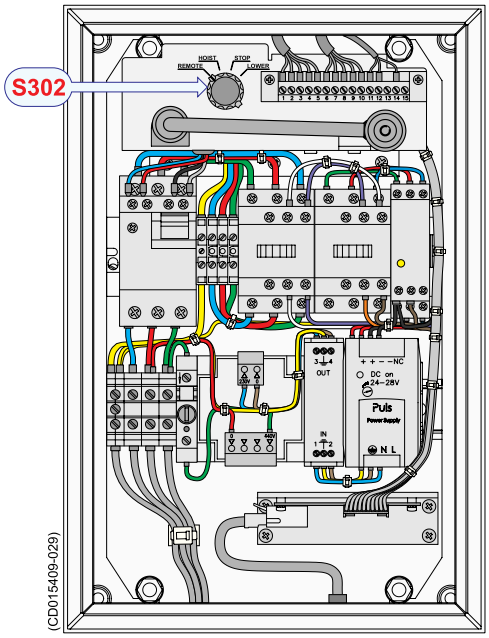
Figure 53 Location of S301, S302, K301, K302, L1 and L2



Manual lowering and hoisting using hoist/lower switch S302

If both the 3-phase voltage for the hoisting motor and the +24 Vdc from the internal power supply are available (indicators **L1** and **L2** are illuminated), the transducer can be hoisted or lowered by switch **S302** in the Motor Control Unit.

Figure 54 Location of S302 in the Motor Control Unit



How to lower the transducer from the sonar room

This procedure explains how to lower the transducer shaft and transducer from the sonar room. The control switches inside the Motor Control Unit are used.

1 In the Motor Control Unit, set the hoist/lower switch **S302** to LOWER.

If the switch **S302** is in REMOTE position, an unwanted hoist operation may occur when the switch pass the HOIST position. To avoid this, use the following procedure:

1 Locate the motor protecting switch **S301**.

2 Release **S301** by pressing the handle down to position OFF.

3 Set switch **S302** to position STOP.

4 On **S301**, press the handle up to position ON to activate the motor protecting switch.

5 Set switch **S302** to position LOWER to lower the transducer shaft.

2 Observe that the transducer is lowered.

- The hoisting motor will automatically stop when the transducer shaft reaches the lower limit switch.
- If necessary, the lowering can easily be stopped in any position by setting the switch **S302** to position STOP.

3 When the transducer shaft has been lowered to the requested position, set switch **S302** to position STOP.

How to hoist the transducer from the sonar room

This procedure explains how to hoist the transducer shaft and transducer from the sonar room. The control switches inside the Motor Control Unit are used.

1 In the Motor Control Unit, set the hoist/lower switch **S302** to HOIST.

2 Observe that the transducer is hoisted.

- The hoisting motor will automatically stop when the transducer shaft reaches the upper limit switch.
- If necessary, the hoisting can easily be stopped in any position by setting the switch **S302** to position STOP.

3 When the transducer shaft has been hoisted to the requested position, set switch **S302** to position STOP.

Finalizing maintenance work

When the maintenance work on the hull unit has finished, use hoist/lower switch **S302** to hoist the transducer to its upper position.

The, set the hoist/lower switch **S302** to REMOTE.

Manual lowering and hoisting using the hand crank

If the normal hoist/lower operation does not work, and the 3-phase voltage for the hoisting motor is unavailable (indicators **L1** and **L2** are not illuminated), the transducer can be hoisted or lowered manually by means of the hand crank.

1 Remove the 3–phase mains fuse for the hull unit.

2 Locate the motor protecting switch **S301** in the Motor Control Unit.

3 Release **S301** by moving the handle down to position OFF.

4 Locate the hand crank inside the Motor Control Unit.

5 Remove the plastic plug on the top cover of the Hull Unit, and mount the hand crank onto the stub shaft through the hole in the top cover.

6 Use the hand crank to lower and hoist the transducer.

Continue until the transducer is fully lowered or hoisted.

7 Remove the hand crank from the stub shaft, and mount it in its storage position in the Motor Control Unit.

8 Activate the **S301** motor protecting switch by moving the handle up to position ON.

9 Re-insert the 3–phase mains fuse for the hull unit.

Emergency lowering and hoisting operation

If the normal hoist/lower operation does not work, even though the 3–phase voltage for the Motor Control unit is available (indicator **L1** illuminated), the transducer can be hoisted and lowered by manual operation of the hoist (**K301**) and lower (**K302**) contactors in the Motor Control Unit.

WARNING

As this operation overrides the upper and lower limit switches, the contactors must be released before the transducer shaft reaches upper or lower position. If not, it may cause serious mechanical damage to the hull unit.

For this reason, this procedure must only be used in emergencies.

1 Secure the system for any remote operation by setting the hoist/lower switch **S302** to position STOP.

2 Locate the particular contactor (**K301** for hoisting and **K302** for lowering) and open the transparent plastic cover on the front of the contactor.

3 Use a screw driver to press the blue spring return actuator to apply the 3-phase voltage to the motor.

4 Observe the movement of the transducer shaft, and release the actuator in due time before the transducer shaft reaches upper or lower position.

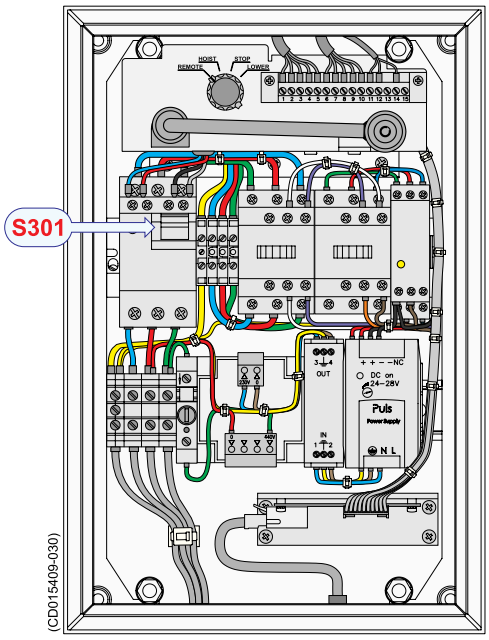
Motor protecting switch (S301)

To prevent the hoisting motor from overload, the 3-phase voltage for the motor is fused with the current adjustable Motor Protecting Switch **S301**. This switch is located inside the Motor Control Unit.

The motor protecting switch will automatically disable hoisting and lowering, if:

- the vessel's speed is too high
- the transducer shaft has been bent
- the lubrication reservoir on the Hull Unit is empty

Figure 55 Location of S301 in the Motor Control Unit



To reset motor protecting switch **S301**, open the Motor Control Unit, locate **S301** and move the handle up to ON.

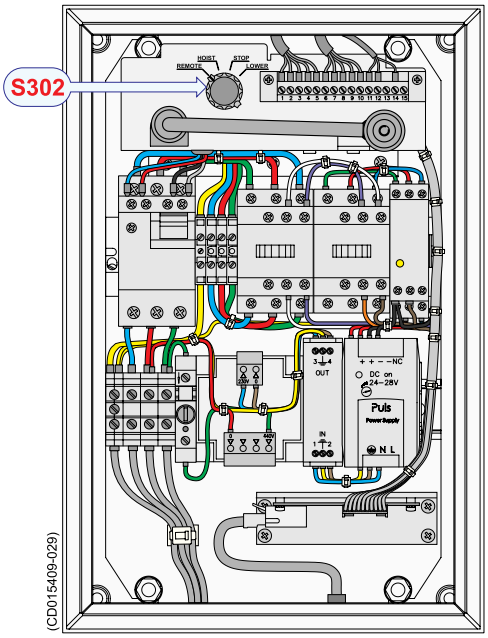
Docking the vessel

When docking the vessel, great care must be taken not to damage the sonar trunk and protecting blister.

WARNING

The sonar must never be powered up when the ship is in dry dock. The transducer will be damaged if it transmits in open air. To prevent inadvertent use of the sonar, set the main on/off switch on the Processor Unit to Off, or disconnect the mains power, whenever the vessel is in dry dock.

Figure 56 Location of S302 in the Motor Control Unit



Preparation for dry docking

Observe the following procedure before the ship is placed in dry dock

1. Ensure that the transducer shaft is fully retracted.
2. Power off the sonar system.
3. Disconnect the mains power to the Processor Unit.
4. Place a label on the Operating Panel to inform all users that the sonar can not be powered up while the ship is in dry dock.

Functional test of the hull unit after dry docking

This procedure explains how to do a functional check of the hull unit. The test is typically done when the ship has been taken out of dry dock.

1. Ensure that the water depth below the vessel is sufficient to lower the transducer.
2. In the Motor Control Unit, set the hoist/lower switch **S302** to position LOWER.
3. Observe that the transducer is lowered down into the water.

   The hoisting motor will automatically stop when the transducer shaft reaches the lower limit switch.
4. Set the hoist/lower switch **S302** to position STOP.
5. Check that the transducer is lowered properly, that the transducer cable is not tangled in any way, and that no other objects interfere with the operation.

6 Check that the transducer is lowered without any ominous noises from the hoist screw or the motor.

7 Check that no water penetrates through the top of the transducer shaft sleeve.

If water is penetrating, you need to add lubricant.

→ *Hull unit lubrication* on page 207.

8 Set the hoist/lower switch **S302** to position HOIST.

9 Observe that the transducer is hoisted from the water.

The hoisting motor will automatically stop when the transducer shaft reaches the upper limit switch.

10 Check that the transducer is hoisted properly, that the transducer cable is not tangled in any way, and that no other objects interfere with the operation.

11 Set the hoist/lower switch **S302** to position REMOTE.

12 Close and secure the Motor Control Unit.

13 Connect the mains power to the Processor Unit.

14 Remove the warning label on the Operating Panel.

Cleaning the transducer

The transducer normally needs little attention. However, the transducer face should be inspected and cleaned when docking.

Note

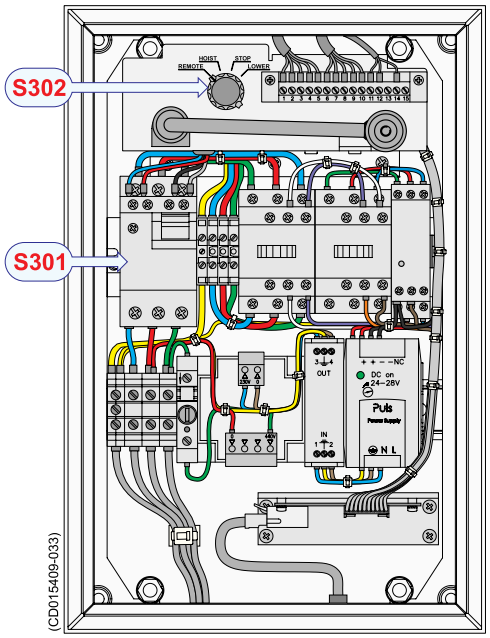
Do not paint the transducer with traditional hull plating paint. Use only the correct type of paint approved by Simrad.

Do not use metal tools or high pressure water on the transducer.

1 Ensure that the distance between the vessel hull and the bottom of the dry dock is sufficient to lower the transducer.

2 In the Motor Control Unit, set the hoist/lower switch **S302** to position LOWER.

Figure 57 Location of S301 and S302 in the Motor Control Unit



3 Observe that the transducer is lowered.

The hoisting motor will automatically stop when the transducer shaft reaches the lower limit switch, but you can stop the lowering earlier by switching **S302** to position STOP.

4 Set the hoist/lower switch **S302** to position STOP.

5 Release the motor protecting switch **S301** by pressing its handle down to position OFF.

6 Place a label on the Motor Control Unit to inform other personnel that the transducer has been lowered for maintenance purposes.

7 Perform a thorough check of the transducer. If necessary, clean it.

1 To clean the transducer, use normal synthetic soap and water.

2 To remove marine growth, use fine-grade sandpaper or emery paper.

3 Do not use strong solvents.

4 Do not attempt to scrape of marine growth with sheets of metal, screwdrivers or other metallic tools.

5 Do not use high pressure water to clean the transducer.

8 Activate the motor protecting switch **S301** by pressing the handle to position UP.

9 Set the hoist/lower switch **S302** to position HOIST.

10 Observe that the transducer is hoisted.

The hoisting motor will automatically stop when the transducer shaft reaches the upper limit switch.

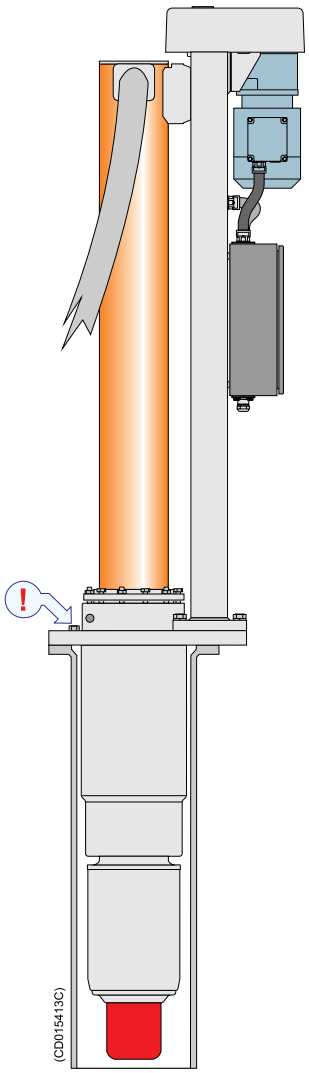
11 Set the hoist/lower switch **S302** to position REMOTE.

12 Close and secure the Motor Control Unit.

Air bleeding

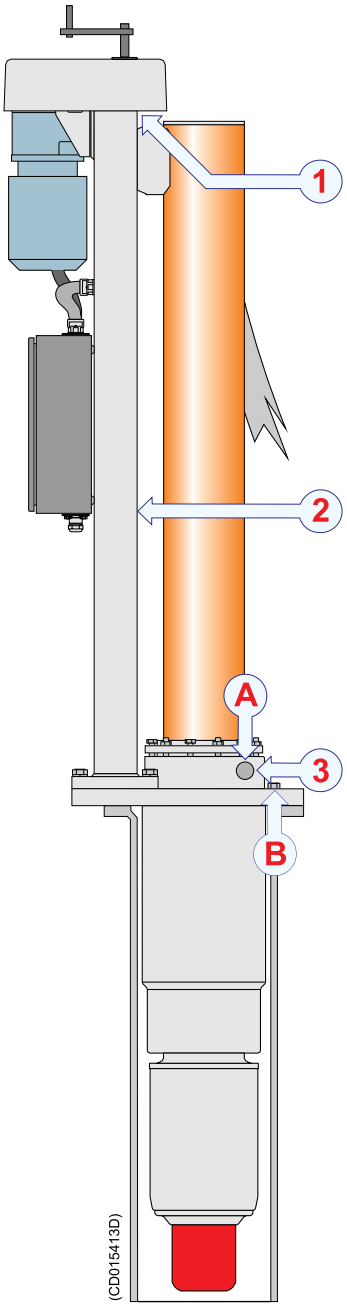
After the vessel has been in dry dock, use the air bleeding plug (indicated in the illustration) to get the air out of the trunk. Loosen the plug carefully one or two turns, until the air inside the trunk starts seeping out. When water appears, tighten the screw firmly.

Figure 58 Location of the air bleeding cock



Hull unit lubrication

The hull unit is fully lubricated when it is installed on the vessel. During normal conditions, the lubricants applied will last for a long period of time. Additional lubrication of the hull unit must only take place when it is required.



Observe the following procedure. The numbers refer to the lubrication points on the illustration.

A *Pressure release plug (grease nipple on rear side)*

B *Air bleeding plug*

1 Inspect the ball bearings on the top of the hoist/lower screw (**1**). Grease only if required using normal ball bearing grease.

2 Inspect the hoisting spindle (**2**). Lubricate only if required using *Tonna Slideway Oils S68* or similar grade lubricant. If too much lubricant is applied to the hoisting spindle, you may experience a lot of spillage when it rotates in high speed.

3 Topping up the shaft sleeve through the grease nipple is only required if the shaft is dry from lubrication, or if water tends to force its way up along the shaft.

If you detect a water leakage, or if the transducer shaft is dry, you may add extra grease.

- Open the pressure release plug (**A**).
- Add extra grease into the shaft sleeve through the grease nipple

  Do not add excessive amounts of grease. The total capacity of the shaft sleeve is less than four kilos.

  Use one of these grease types, or an equivalent type with similar characteristics:

  – *Esso Cazar K1*

  – *Shell Rhodina EP2*

  – *Shell Alvina EP2*

WARNING

When you top up the shaft sleeve with oil, you must open the pressure release plug to avoid damage to the shaft bearings.

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Simrad SH90 Fish finding sonar
Reference manual

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